

CALIFORNIA  
ACADEMY OF SCIENCES

MEMBER PUBLICATION

FALL 2007



**Reef Sharks Return**  
Nature's Original Bombshells  
Science Meets Art in *From the Depths*





It's official! The big day that once seemed so distant is now just a year away. I'm referring, of course, not to the next Presidential election or the 111th Big Game match up, but to an event that I hope will be just as eagerly anticipated by many Bay Area residents—opening day for the new California Academy of Sciences in Golden Gate Park. The excitement is certainly building here at 875 Howard Street. The fish are swimming faster in anticipation of their enormous new tanks, and the penguins are primping and preening in preparation for their homecoming parade. (We won't actually make them march, but we might look into having them ride on MUNI. We are, after all, all about sustainability!)

Inside this newsletter you'll find information about some of the stunning exhibits and aquarium displays that will make the new Academy unique among the world's great museums. As if all that weren't enough, here's another update that is sure to whet your appetite for opening day—the new Academy will also be a great place to eat. We are excited to announce that two of San Francisco's most distinguished chefs, Charles Phan of The Slanted Door and Loretta Keller of COCO500, will run the museum's new restaurant and café. Like the rest of the new building, the restaurant and café will emphasize the importance of sustainability and support the Academy's mission to explore, explain, and protect the natural world. The full-service restaurant, which will serve both lunch and dinner, will function as a museum exhibit in the form of a restaurant, communicating the vital relationship between food, culture, and environment. The informal café will offer healthy, kid-friendly, multicultural food to a wide demographic, elevating the typical museum food experience.

Between now and opening day, we will have our hands full—both literally and figuratively—as we begin to move thousands of live animals and millions of research specimens into our new home. In order to make sure the move goes as quickly and smoothly as possible, we will be closing our Howard Street museum on January 6. We hope you will visit us often over the next few months to wish your favorite Academy animals well before they embark on their big migration. The penguins will most certainly miss their fans during the move, but they will be eagerly waiting to welcome visitors to their new home in the fall of 2008. So will the rest of us!

- Greg Farrington, Executive Director

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#### On the Cover

Four new black-tipped reef sharks now swim at Howard Street. The sharks will eventually move into the the new Coral Reef tank in Golden Gate Park.

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*Steinhart Aquarium biologist Ned McAllister holds an Oustalet's chameleon, one of the largest species of chameleon in Madagascar. This young lizard will reside in the new Academy's rainforest dome.*

# Howard Street Headcount Grows

## *Hundreds of new Reef and Rainforest Residents Arrive*

**A**lthough they faced stiff competition from both the penguins and the alligators, reef sharks were among the most popular inhabitants of the original Steinhart Aquarium location in Golden Gate Park. Now these iconic animals are on display for the first time at 875 Howard Street. Four young black-tipped reef sharks – future occupants of the new Academy's Coral Reef tank – are now swimming on the first floor of the Howard Street museum. They are just a few of the hundreds of new animals that have recently relocated to San Francisco in preparation for the opening of the new Academy in Golden Gate Park.

Many of the newcomers, including hundreds of colorful tropical reef fish and a wide range of soft and stony corals, will eventually join the black-tips in the new Academy's 212,000-gallon Coral Reef tank. The new coral colonies were recently donated by the Waikiki Aquarium in Hawaii and Atlantis Marine World in Long Island, where they were propagated in captivity. Many of these species were previously unrepresented in the Academy's living coral collection. Steinhart Aquarium biologists are also preparing to receive a sea turtle and 10 bamboo sharks in the next few weeks, all of which are earmarked for the shallow Lagoon

section of the Coral Reef tank. Six new moray eels will make their home in smaller tanks around the main Coral Reef exhibit.

Meanwhile, a number of new animals for the Rainforests of the World exhibit have also joined the ranks of the Howard Street inhabitants, including yellow-headed day geckos, Bornean eared frogs, blue webbed frogs and red-eyed tree frogs. The Denver Zoo also sent a shipment of Malagasy freshwater fishes, all of which were bred in captivity. Freshwater fish are the most endangered vertebrates in Madagascar, and many of them are found only



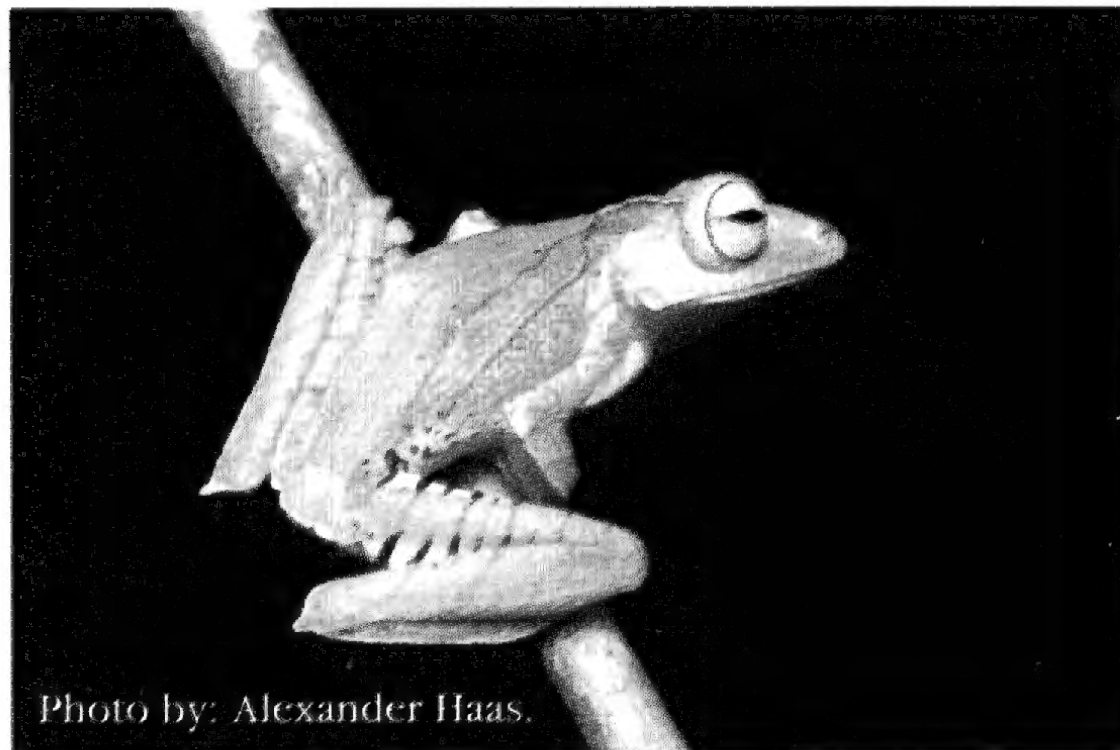


Photo by: Alexander Haas.



Photo by: Dr. Peter Weish.



Photo by: Dong Lin.

Top left: Bornean eared frog (*Polypedates otilophus*). Bottom left: Red-eyed tree frog (*Agalychnis callidryas*).  
Top right: Leaf cutter ants (*attacephalotes*).

in a single river basin. The Academy will participate in a captive breeding program for these fish, helping to ensure their survival.

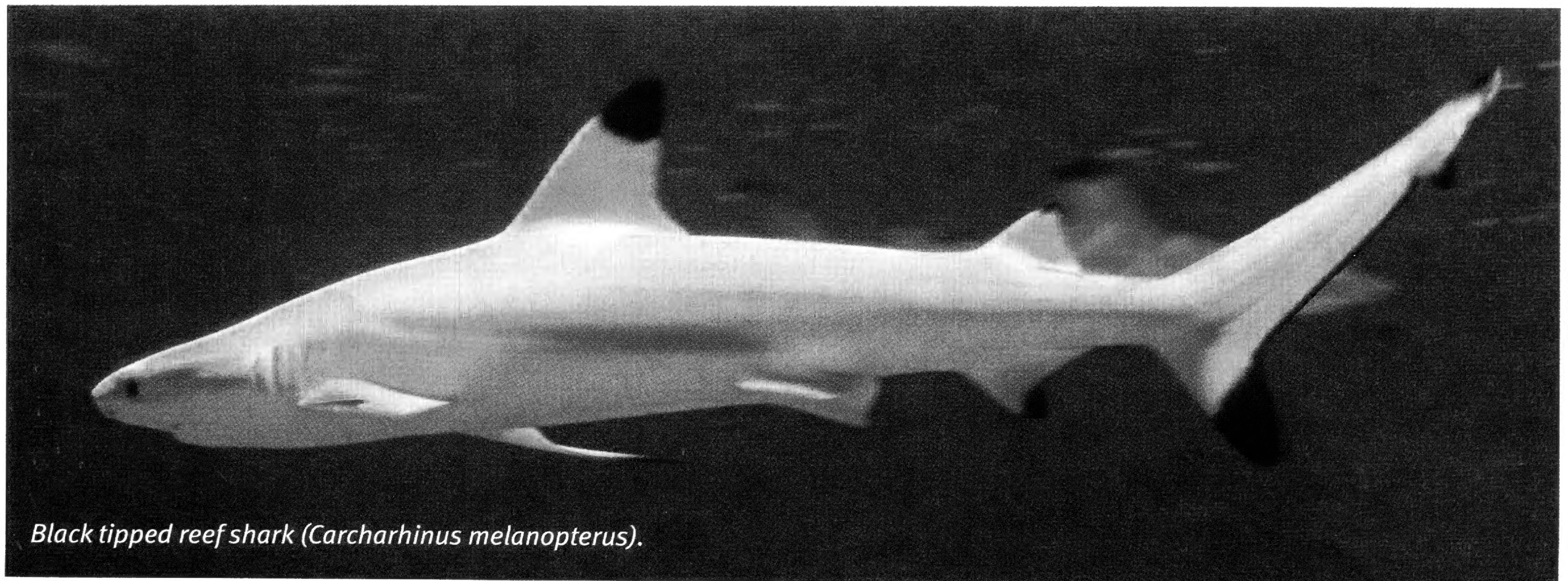
The Madagascar gallery of the rainforest dome will also house a number of chameleons, including two individuals—an Oustalet's chameleon and a panther chameleon—who are now living behind-the-scenes at Howard Street. Like many other species from Madagascar, these charismatic creatures are endemic to the island, meaning they cannot be found anywhere else on Earth. Because it has been isolated from other land

masses for almost 100 million years, Madagascar is home to an extremely high number of endemic species, including almost half of the world's known species of chameleons.

Another group of newcomers destined for the rainforest dome arrived at the end of August and are already busy growing gardens of fungus. Currently working behind-the-scenes at Howard Street, these two colonies of leaf cutter ants will eventually inhabit a fallen log inside the living rainforest. Previously on display during the *ANTS* exhibit, these industrious ants received rave reviews from visitors of

all ages for their tremendous strength and work ethic.

Although the rainforest dome and reef tank are not yet ready to receive animals, their habitats will soon become much more hospitable. In late November, live rainforest and mangrove trees will be shipped to the new Academy building in Golden Gate Park and installed into the exhibits. When they arrive, the rainforest trees will be about 25 feet tall, while the mangroves will stand at about 10 feet in height. By January, the first animals will begin to make the great migration back to Golden Gate Park and both exhibits will begin—quite literally—to come to life.



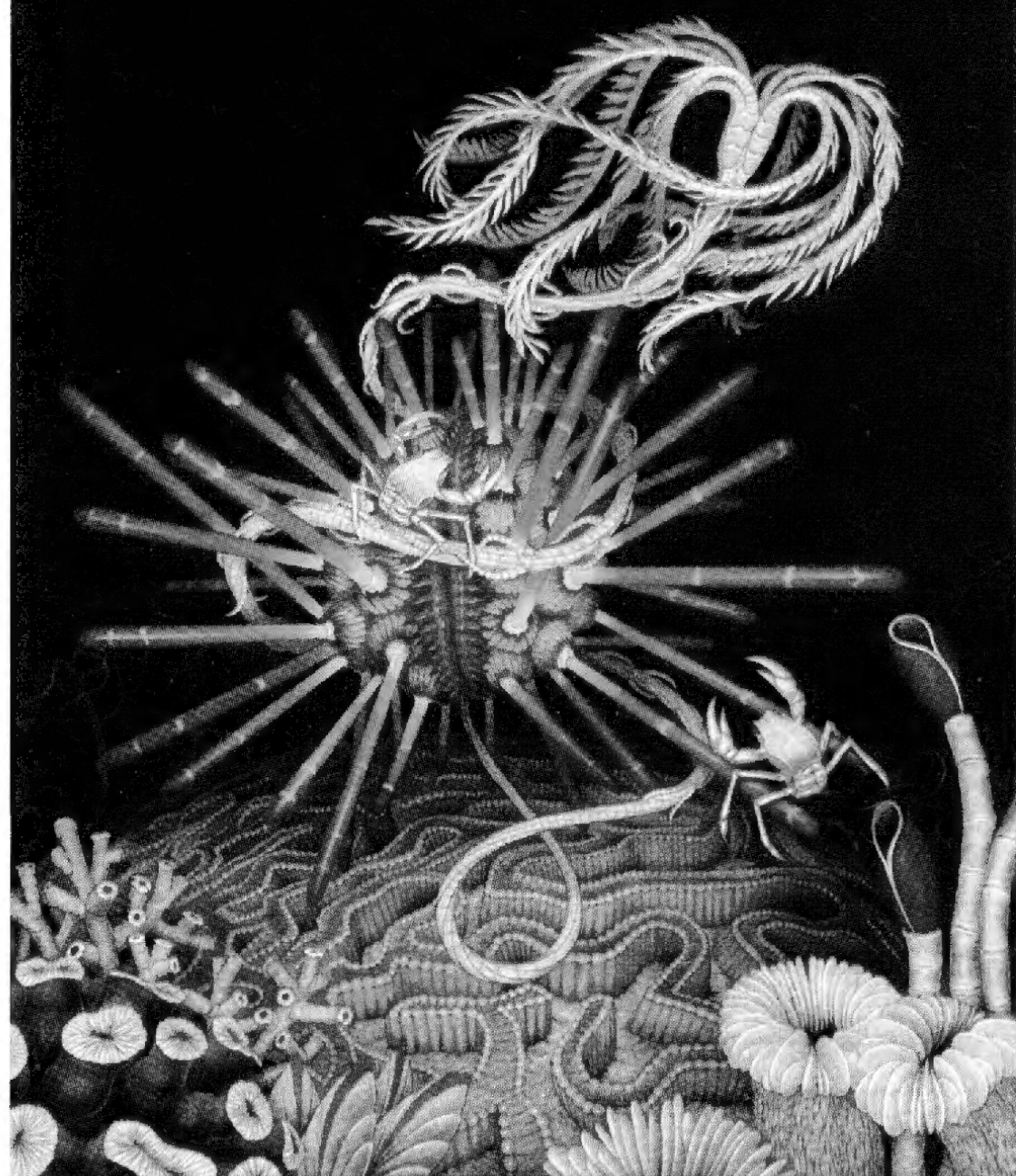
Black tipped reef shark (*Carcharhinus melanopterus*).



## NEW EXHIBIT OPENS ON NOVEMBER 15

### From the Depths: Inspiring Science and Art

**November 15, 2007 -  
January 6, 2008**



*Painting from the exhibit*

As one of the Academy's first Artists in Residence, contemporary painter Tiffany Bozic partnered with one of the Academy's curators, Dr. Rich Mooi, to explore the museum's vast collection of marine invertebrates. The result is *From the Depths*, a new exhibit at Howard Street that opens November 15. Large-scale paintings and sketches will transport you into the depths of both the ocean and the imagination, presenting an artist's vision of the life-and-death drama that unfolds beneath the sea. The exhibit also includes live tanks, preserved specimens, and photographs. It reveals the passion for the process of discovery and understanding life that both scientists and artists share.

#### DON'T MISS THE FOLLOWING EXHIBIT-RELATED PROGRAMS:

##### Academy Lecture

**Tuesday, November 13 • 2 pm & 7:30 pm**  
See page 8 for details.

##### Opening Night Reception

**Thursday, November 15 • 5 pm - 9 pm**  
*From the Depths* will be unveiled during the Academy's Third Thursday event, which includes music and a cash bar featuring *Francis Ford Coppola* wine.  
**\$5 admission; free for members.**

In conjunction with *From the Depths*, the Yerba Buena Center for the Arts (YBCA) encourages all Academy members to view *BioTechnique*, an upcoming exhibit of art inspired by biotechnology, and to attend the following YBCA-Academy programs. Visit [www.ybca.org](http://www.ybca.org) for details about *BioTechnique*.

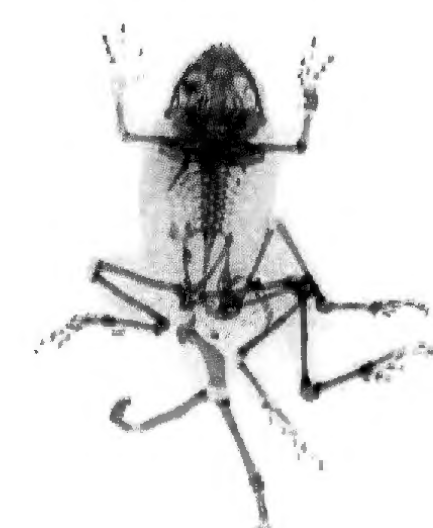
#### **BioTechnique Opening Reception** **Thursday, October 25 • 6 pm - 9 pm**

YBCA, 701 Mission Street,  
San Francisco  
**\$10 admission;**  
**first 50 members get in free.**

#### **Technebiotics**

**Friday, November 2 •**  
**2 pm - 5 pm**

California College of  
the Arts, 1111 8th  
Street, San Francisco  
Enjoy an afternoon of  
live demonstrations  
of different biological  
techniques: DNA  
spooling, plant  
hybridization, cell  
extraction, and more.  
**Free admission.**



*From BioTechnique*

## Farewell to Howard Street Transitional Museum to Close on January 6

The tanks have been water tested, the rainforest dome has been sealed, and the filtration systems are ready to rumble — it's nearly time for the Academy's animals to start moving into their new home in Golden Gate Park. In order to make sure this great migration goes as quickly and smoothly as possible, the Academy's transitional museum at 875 Howard Street will close its doors to the public at 5:00 pm on Sunday, January 6, 2008.

For three and a half years, Howard Street has provided thousands of visitors with an opportunity to explore the natural world in innovative and meaningful ways. It has also functioned

as a laboratory, allowing Academy exhibit designers and biologists to test new concepts and animal care strategies. Many of the most successful experiments, such as the live colony of leaf cutter ants that were put on display in the 2004 *ANTS* exhibit, will reappear in some form in the new Academy in Golden Gate Park.

In the meantime, the Academy will continue to offer lectures and other programs for its members throughout the move back to Golden Gate Park. Members will also be invited to preview the new museum before the official public opening in the fall of 2008.





## SEPTEMBER OCTOBER, & NOVEMBER

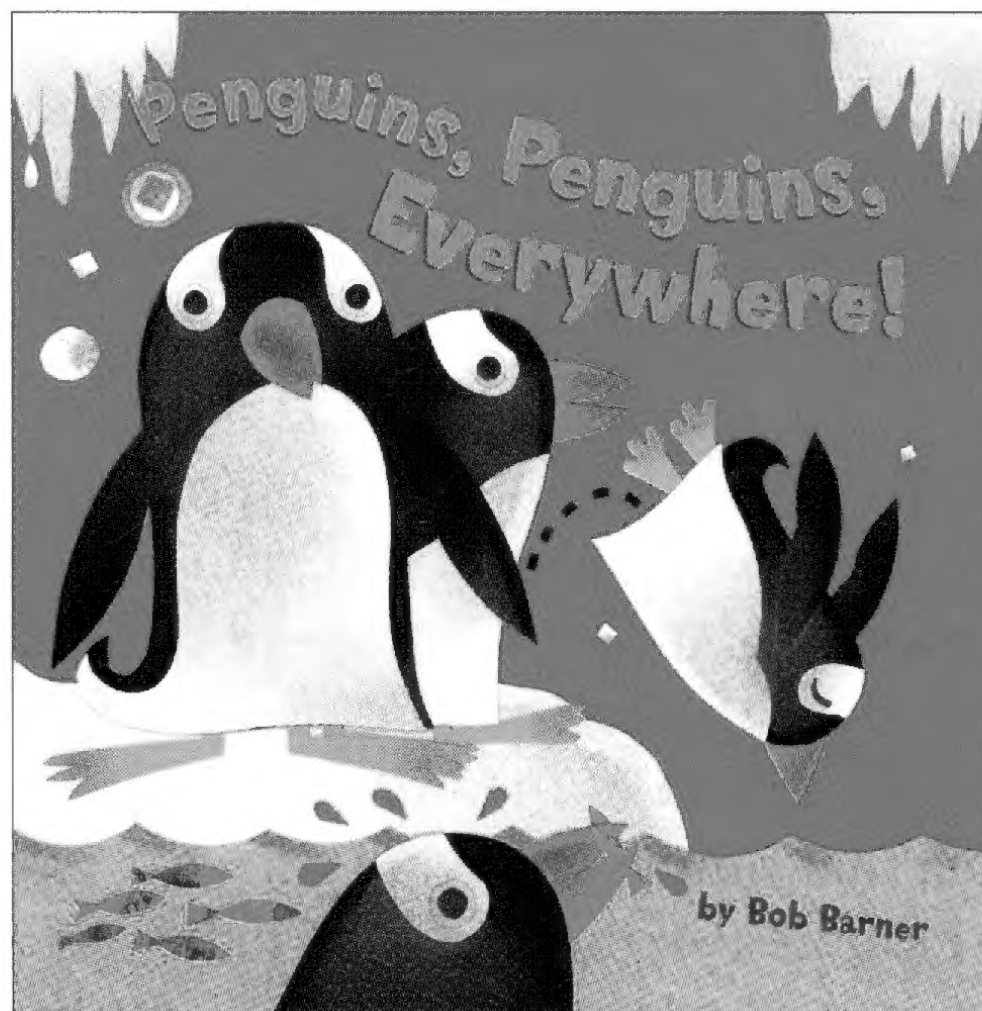
### Penguin Feeding Every Day 11:00 am & 3:30 pm



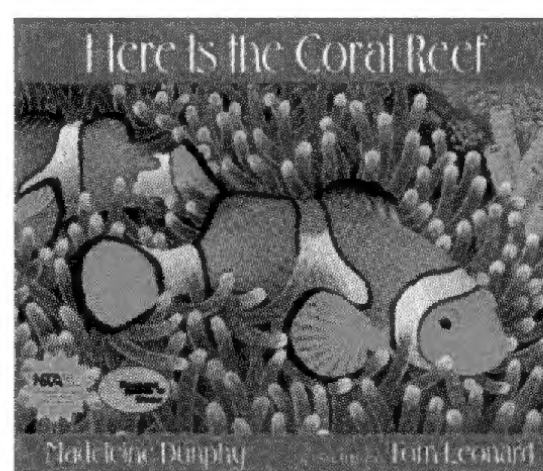
Watch the Academy's African penguins dip and dive in their tank and maintain their shelters. Every day at 11 am and 3:30 pm, visitors can enjoy feeding shows and ask questions as an aquatic biologist dons a wet suit, takes temperature measurements, and then tosses vitamin-stuffed herring and capelin to the penguins. Each feeding takes 20 minutes.

### Story Time Every Saturday 10:30 am

Explore nature with a story for children ages 3-5. On September 29, the Academy is pleased to welcome back Bob Barner,



who will read his new book, *Penguins, Penguins, Everywhere!* This award-winning author and artist combines colorful images and whimsical verse to create a funny, bouncy, informative introduction to the world of penguins. On October 20, award-winning children's book author Madeleine Dunphy will read her lyrical rhyming tale, *Here Is The Coral Reef*. Beginning with



coral, Dunphy uses simple yet forceful verse to reveal the fragile chain that links each of the organisms in the reef environment. Signed copies will be available at both readings.

### Home School Day at the Academy — An Experience to Remember!

**Thursday, October 4**  
**10:00 am-5:00 pm**

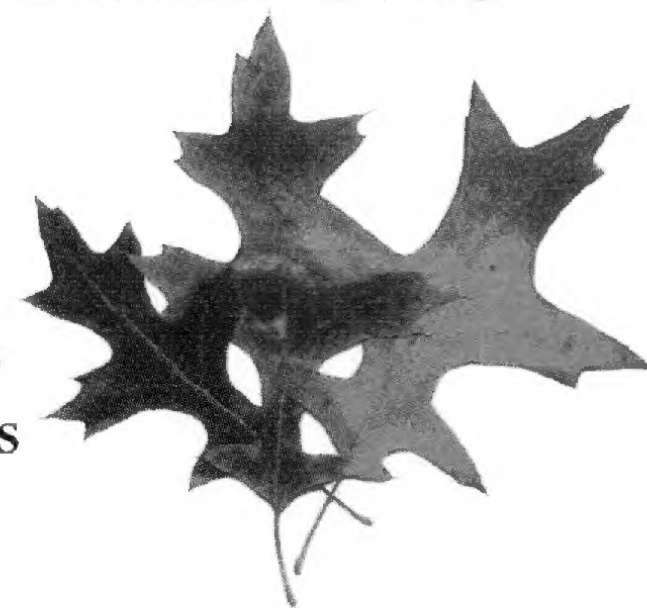
Calling all home-schoolers! Join the Academy for a day of exploration. Watch the penguins dip and dive, touch a shark, and learn about the fragile coral reef. For more information, visit:  
[www.calacademy.org/education](http://www.calacademy.org/education).

### Family Nature Crafts

**Sunday-Monday, October 7-8 &  
November 11-12**

**Friday & Sunday, November 23 & 25**  
**10:30 am**

Share some quality "You and Me" time with your child. Drop by the craft tables and make a fun project!



## SAVE THE DATE!



CALIFORNIA ACADEMY of SCIENCES

# RUN WILD!

Run Wild 5K/10K

### 2007 REGISTRATION DATES

**August 15 - November 23 (noon):**

Online registration available  
on the Run Wild website

**November 16 :** Last day to register by mail

**November 18-24:**

In-person registration available at the Academy

**November 25:** Run Wild!

The Academy's annual Thanksgiving weekend tradition, Run Wild 5K/10K, will take place on Sunday, November 25, 2007. Participants are encouraged to run, waddle, mosey, or skip wildly through the course. Those who can't contain their inner beast can enter the 5K costume contest! Costumes that incorporate the best plumage, most exotic adaptation, and most ferocious features of the lot will be awarded prizes.

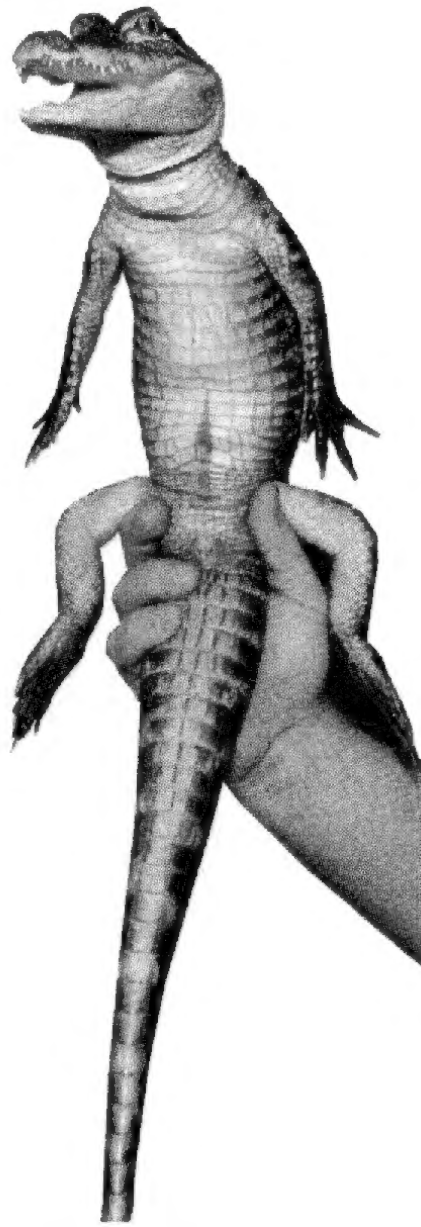
Every registered Run Wild participant will receive an official long sleeve T-shirt, a goodie bag, and free refreshments. In addition, all are encouraged to visit the Academy's tent and learn about the new building, which will be open by the time the 2008 Run Wild rolls around! All ages are welcome. Pre-registration for members is \$24. For more information or to sign up, visit [www.calacademy.org](http://www.calacademy.org) and click on Run Wild! The first registrants will receive a souvenir medal while supplies last.



# SEPTEMBER OCTOBER, & NOVEMBER

**Rockin' Reptiles**  
**Saturday-Monday,**  
**October 6-8**  
**Saturday-Sunday,**  
**November 10-11, 24-25**  
**1:00 pm**

Join Academy interns as they share fun facts about reptiles from around the world. You might meet an American alligator, ball python, rosy boa, or corn snake and perhaps touch it as well!



**Meet the Biologist**  
**Saturday-Monday,**  
**October 6-8 & November**  
**10-12**  
**Friday-Sunday,**  
**November 23-25**  
**2:00 pm**

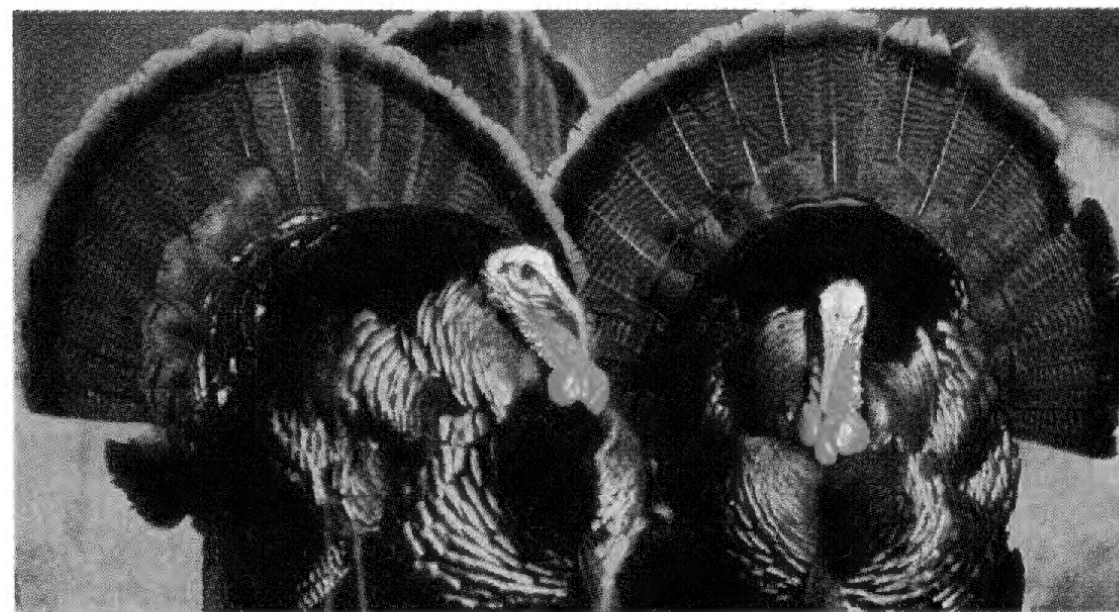
Meet an Academy biologist and discover how to care for aquarium creatures. Depending on the animal you visit, you may learn how to take and test water samples, check filters, clean tanks, or administer appropriate amounts of food.

**Great White Sharks**  
**of the Farallon Islands**  
**Monday, November 12**  
**1:00 pm**

Near the Bay Area, great white sharks congregate around the Farallon Islands to feed on seals and sea lions every fall. Explore great white shark biology with Academy naturalist Juan-Carlos Solis and touch real shark teeth.

**Let's Talk Turkey**  
**Friday, November 23**  
**1:00 pm**

Academy naturalist Juan-Carlos Solis will explore the life history and folklore of one of the world's most flavorful and flamboyant birds. During the program, look at Academy specimens and examples of turkey art from around the world.



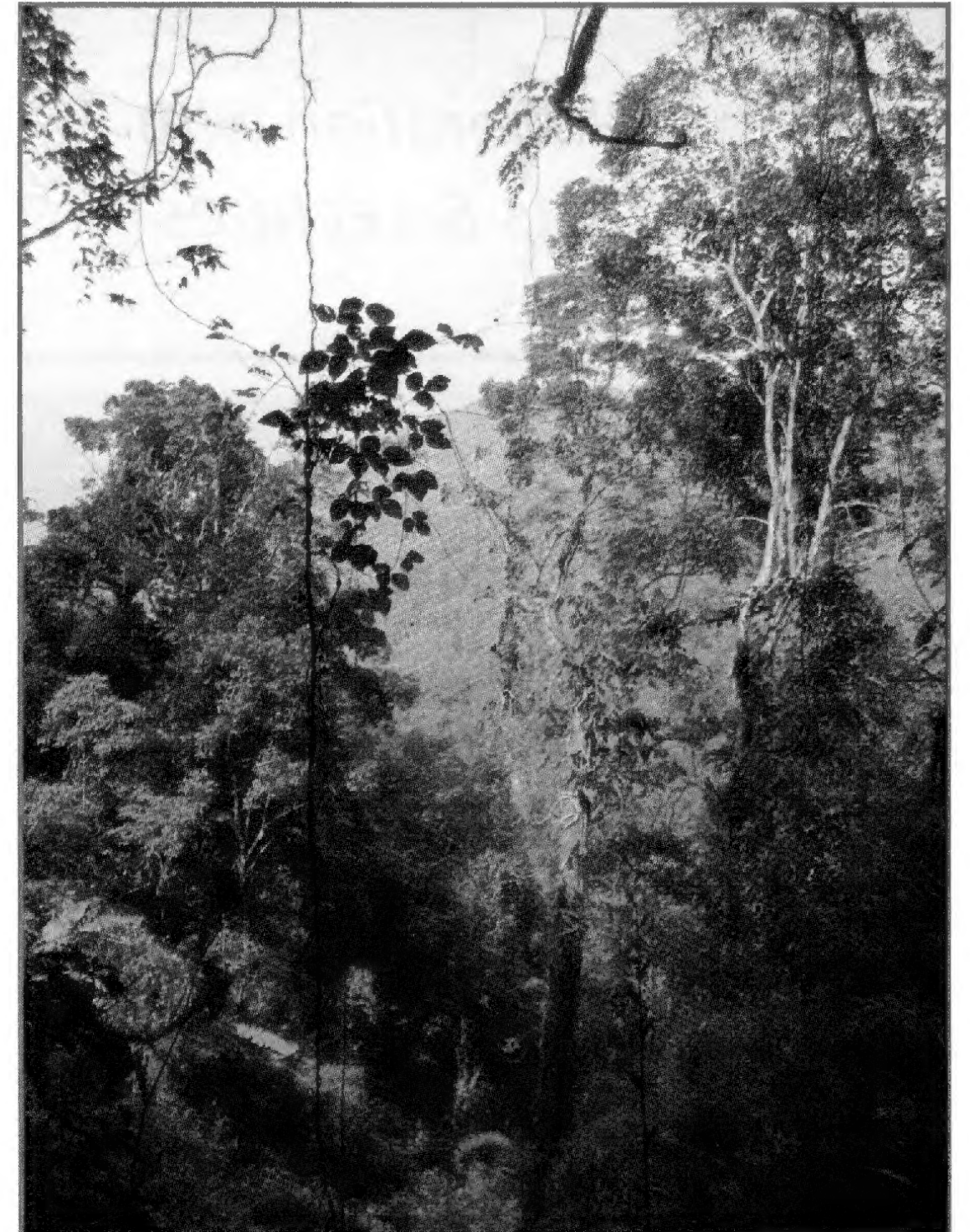
## Academy Members Name Penguin

Congratulations to Helga Mahlmann and James Kaller of Oakland, winners of the members' penguin naming contest. The winning name was "Domino" for the chick that hatched this past April. Helga, a member since 1976, says, "I thought the name was perfect for his black-and-white coloration."



*Helga and James with the new chick Domino*

Thanks to all members for your thoughtful and creative suggestions. Over 300 submissions were received. Other interesting submissions included "Rafiki," "Thabo," "Desmond," "Tickey," and "Peco."



## 23rd BioForum Series for Science Educators

### *Tropical Rainforests: Challenges and New Hopes*

**Saturday, October 20**  
**8:30- 4:00pm at the**  
**Oakland Museum of California**

**Members \$25;**  
**non-members \$30; students \$15**  
**Call (415) 321-8000 to pre-register.**

Learn about the ecological richness of tropical rainforests as well as the challenges associated with preserving these critical habitats. As deforestation advances in many tropical countries, there is widespread recognition that these forests are an important part of local and global climate patterns, as well as hosts to great biodiversity. With visualization tools like GIS, resource managers are gaining a new perspective in the fight to conserve remaining sections of forest as well as restore degraded patches. Lunch is included for pre-registered participants.

**Moderator:** Kevin Welch,  
 Manager of Lectures,  
 California Academy of Sciences



**Special Event****JAMES WATSON**

*In collaboration with  
City Arts & Lectures*

**8:00 pm, Wednesday, September 26**

Co-discoverer of the structure of DNA, in conversation with Roy Eisenhardt

**Location:** The Herbst Theatre, 401 Van Ness Avenue, San Francisco

**Tickets:** \$20. Contact City Box Office at 415-392-4400 or [www.cityboxoffice.com](http://www.cityboxoffice.com).

**ACADEMY LECTURES**

Location: Sequoia Boardroom, California Academy of Sciences

Tickets: Free for Academy members, \$8 non-members.

Tickets can be purchased by calling (415) 321-8000 or at the door, when available.

Also available online at: <https://www.calacademy.org/lectures/tickets/>

**Birds and Bears of Churchill,  
Manitoba: A Wildlife  
Photographer's Vision**

**Eleanor Briccetti, Wildlife Photographer**

**Tuesday, September 18**

**2:00 pm & 7:30 pm**

Although most famous for its polar bears, Churchill is also a prime location for many species of native and migratory birds, such as the Arctic tern, Hudsonian godwit, parasitic yeager, and Pacific loon. Eleanor Briccetti's eye and talent for capturing

wildness gives life to her work that is trumped only by the tales that accompany these photographic gems. Included in this northern journey are Arctic foxes, a release of rehabilitated snowy owls into the wild, and polar bears in various poses as they await the freezing of Hudson Bay and the chance to feed on fur seals.

Photo by: Eleanor Briccetti



*Polar bear mother with cubs*

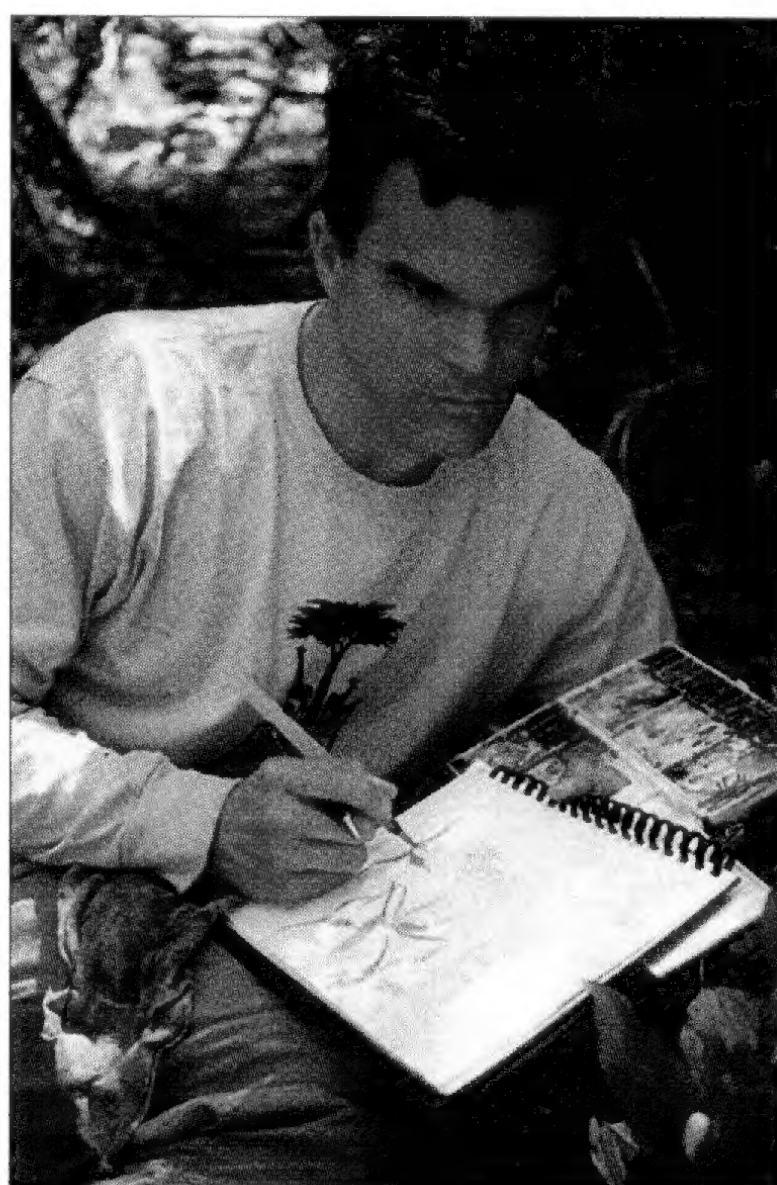
**Exploring the Sierra Nevada  
as a Naturalist and an Artist**

**John Muir Laws**  
Associate,  
California Academy of Sciences

**Tuesday, October 16**

**2:00 pm & 7:30 pm**

John Muir Laws has a simple mission: to enrich the outdoor experience of everyone who sets foot in the Sierra Nevada. For the past six years, Laws has been creating a pocket-size field guide to over 1,700 species found in the Sierra Nevada. The guide boasts an impressive 2,710 original watercolor paintings and has been field-tested and reviewed by educators, naturalists, and scientists. Through his candid and riveting style, Laws discusses astonishing relationships between Sierran species, emerging conservation issues, and techniques for painting in the field. Celebrate the release of *The Laws Field Guide to the Sierra Nevada* and hear about the making of this comprehensive work. Book signing to follow the lecture.



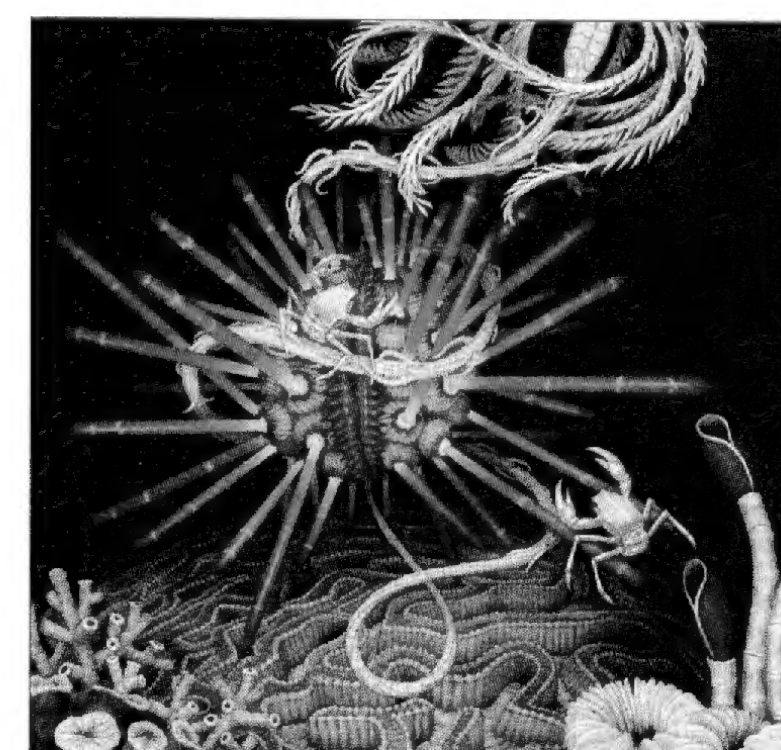
**From the Depths:  
Creating a Science and  
Art Exhibit at the Academy**

**Tiffany Bozic, painter**  
& **Dr. Rich Mooi, Curator of  
Invertebrate Zoology and Geology**

**Tuesday, November 13**

**2:00 pm & 7:30 pm**

What would happen if the Academy's marine invertebrate collections were explored through the eyes of a contemporary painter? For several months, Oakland-based fine artist Tiffany Bozic partnered with Dr. Rich Mooi of Invertebrate Zoology, and the result is *From the Depths*, a science and art exhibit on display from November 15, 2007 - January 6, 2008. Bozic, whose work incorporates richly pigmented acrylic paint on solid maple wood panels, is also inspired by John James Audubon and Ernst Haeckel, but dives deeply into the imaginary and darker aspects of the natural world. Join Bozic and Dr. Mooi as they discuss their collaboration and how they found common ground in their passion for understanding nature. A special preview of *From the Depths* will take place before the evening lecture, from 6:00 - 7:30 pm.





# ★ ★ ★ Stargazing at the SF Botanical Gardens ★ ★ ★

*Dress warmly and bring binoculars and a red-colored flashlight, if you have them.  
In the event of cloudy weather, observing will be cancelled and replaced by a classroom lecture.*

To register or for more information, call (415) 661-1316, ext. 354. Location: San Francisco Botanical Garden in Golden Gate Park  
Prices: \$5 members (\$10 family of four); \$15 non-members (\$20 family)

## Early Autumn Skies

**Friday, October 5 7:30 - 9:00 pm**

Summer has ended; the days are growing shorter and the nights longer. In their slow trek against the stars, three of the five naked-eye planets have moved into the morning sky, and another – Mercury – is quickly disappearing into the sunset. The giant planet Jupiter is still prominent, however, with its belted atmosphere and multiple moons, hovering against the lingering summer constellations Scorpius and Sagittarius. The Summer Triangle remains visible overhead just after sunset, as does mighty Hercules. A laser-guided tour of the constellations is supplemented by telescopic observation of star clusters and nebulae, and sharp-eyed observers might even spot a meteor or a satellite! Sunset is at 6:47 pm.

## Mid-Autumn Skies

**Friday, November 30 6:00 - 7:30 pm**

The approach of winter brings with it early sunsets, and although no planets are visible until Mars rises at about 7 pm, there's still plenty to see among the stars themselves. The constellations of summer are giving way to the star patterns of fall; Pegasus the Flying Horse and Andromeda the Princess are taking center stage from the Summer Triangle. Among these stars are celestial wonders such as star clusters, the Ring Nebula, and the Andromeda Galaxy. Bing Quock of Morrison Planetarium leads a laser-guided tour of the constellations, with telescopic observation of deep-sky wonders. Sunset is at 4:51 pm.

## BENJAMIN DEAN

### LECTURE SERIES IN ASTRONOMY

Location: Jewish Community Center, 3200 California Street, San Francisco

Tickets: \$4, available at [www.calacademy.org/lectures/tickets](http://www.calacademy.org/lectures/tickets)

Series information at [www.calacademy.org/planetarium/dean.php](http://www.calacademy.org/planetarium/dean.php)

For advance notice of lectures, join the Dean email list by sending an email to [deanseries@calacademy.org](mailto:deanseries@calacademy.org).

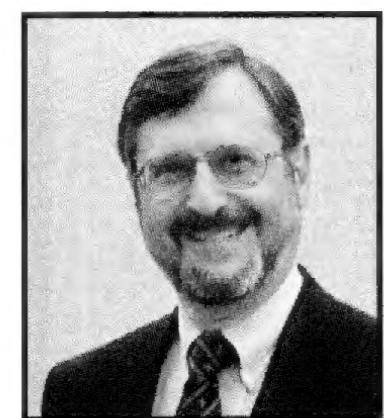


### A Brief Tour of the Universe

Ryan Wyatt, Director of Morrison Planetarium and Science Visualization

**7:30 pm Monday, September 17**

Modern planetaria have transformed into digital domes projecting three-dimensional astronomical datasets, transporting audiences from the solar system out to the edge of the observable Universe. Get a glimpse of the new Morrison Planetarium's capabilities by taking a guided tour through charted space—an experience that will redefine your sense of “home.”

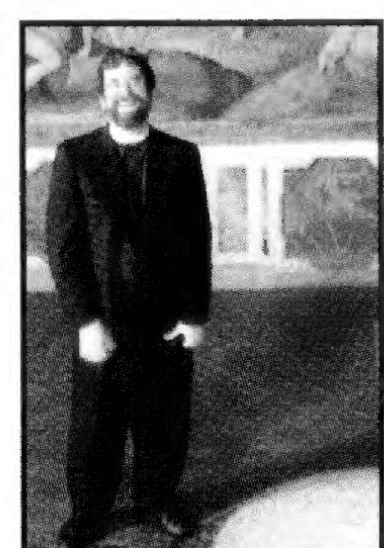


### Black Holes: Space Warps, Time Machines, and the Excruciating Deaths of Stars

Andrew Fraknoi, Foothill College and Astronomical Society of the Pacific

**7:30 pm Monday, October 29**

What is the science behind the science fiction of black holes? How do astronomers find them, and why would falling into one be a once-in-a-lifetime experience? Analogies, slides, thought experiments, and humor will show how black holes warp space, act like a real time machine, and grow to be enormous at the centers of most galaxies.



### Meteorites and the Asteroids They Came From: Are Asteroids Fluffy?

Dr. Guy Consolmagno, Vatican Observatory

**7:30 pm Monday, November 26**

Space probe, radar, and telescopic measurements have led to a reliable determination of asteroid densities. When compared to the densities of meteorites, a new understanding is emerging of how asteroids are put together—with implications for both the origin of planets and future human encounters with Near Earth Objects.



Sunday

Monday

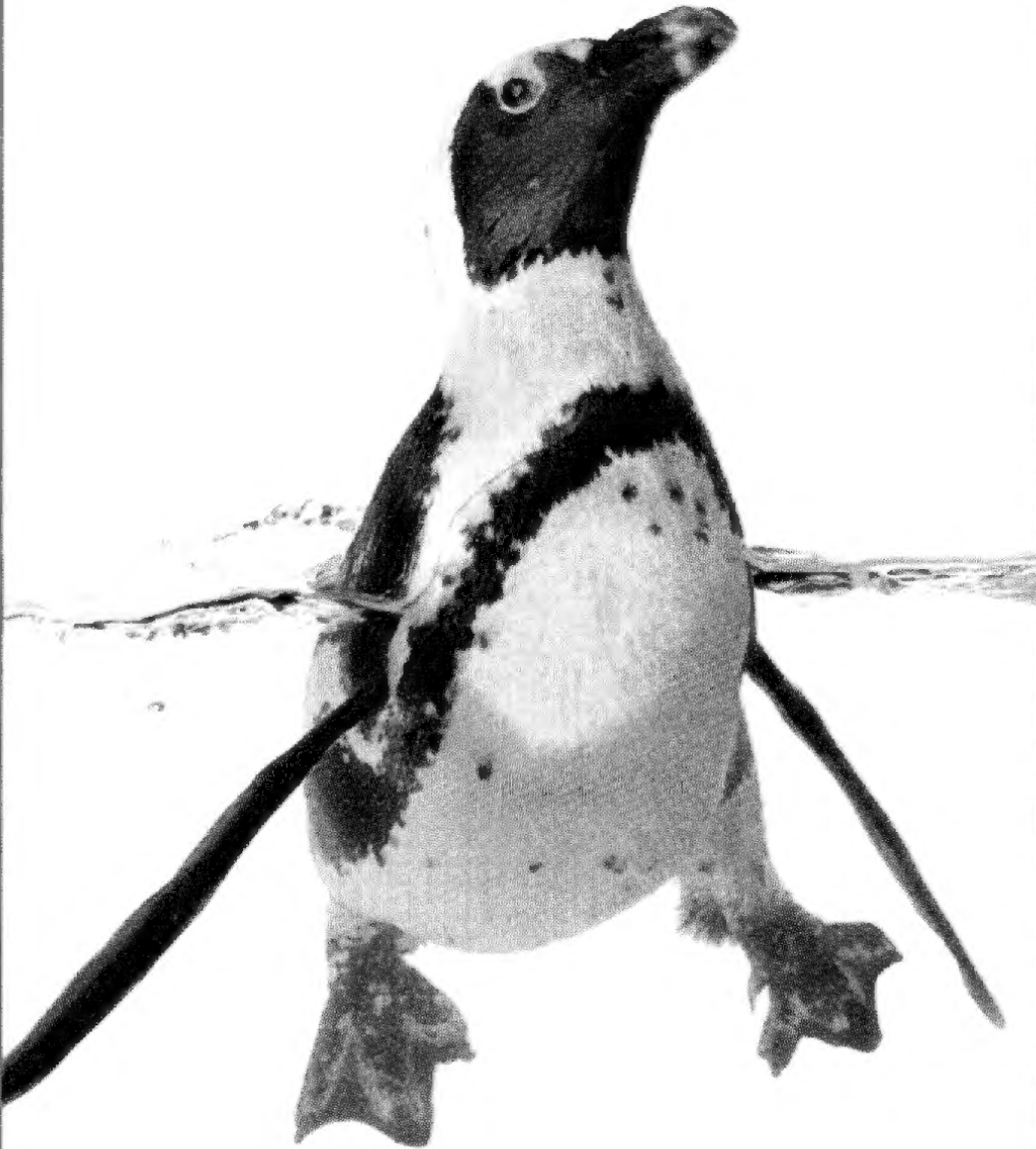
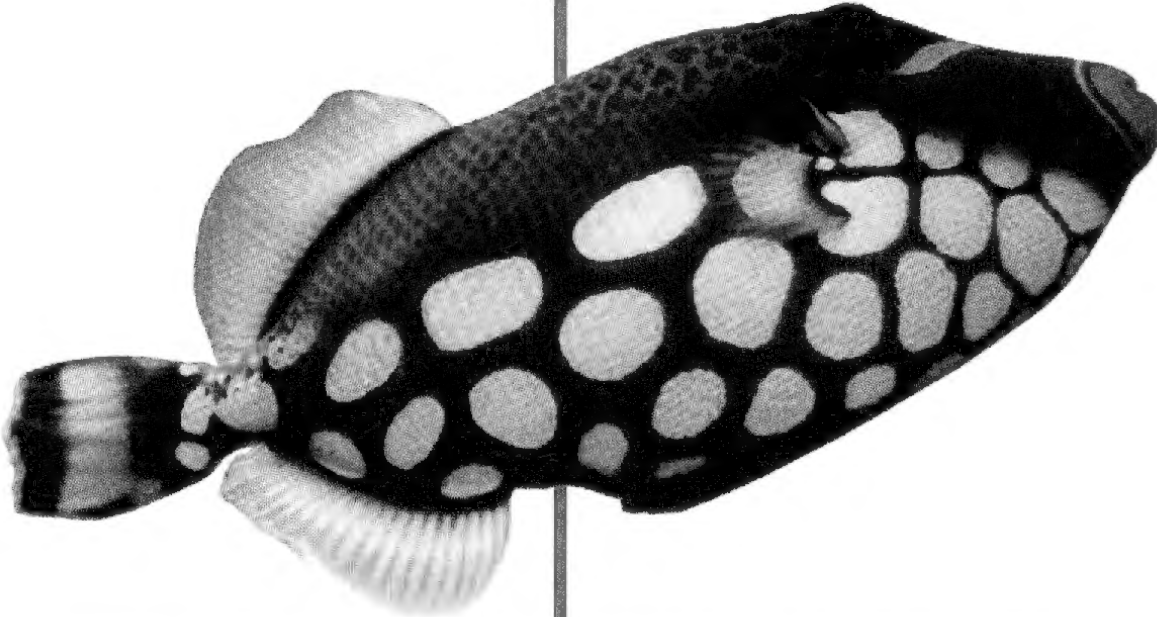
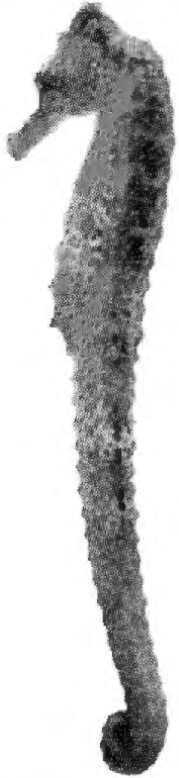
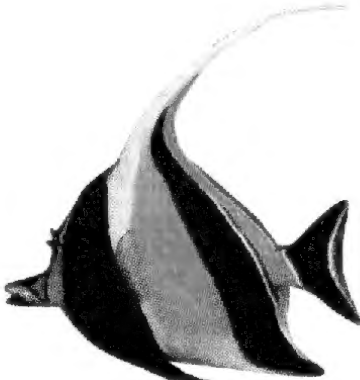

Tuesday

Wednesday

# SEPTEMBER

Please see Programs & Highlights on pages 6-7, and Lectures on pages 8-9 for a full description. For more information, check our website: [www.calacademy.org](http://www.calacademy.org).



<div>PENGUIN FEEDING Every Day 11am &amp; 3:30pm</div> 	<div>3 Penguin Feeding 11:00am Penguin Feeding 3:30pm</div>	<div>4 Penguin Feeding 11:00am Penguin Feeding 3:30pm</div> 	<div>5 Penguin Feeding 11:00am Penguin Feeding 3:30pm</div>
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<div>23 Penguin Feeding 11:00am Penguin Feeding 3:30pm</div>	<div>24 Penguin Feeding 11:00am Penguin Feeding 3:30pm</div> 	<div>25 Penguin Feeding 11:00am Penguin Feeding 3:30pm</div>	<div>26 Penguin Feeding 11:00am Penguin Feeding 3:30pm Special Lecture</div>
<div>30 Penguin Feeding 11:00am Penguin Feeding 3:30pm</div>			


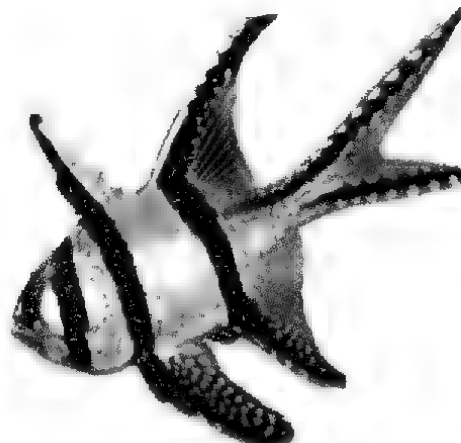




Wednesday

Thursday

Friday

Saturday

<div><p>Visit the <b>NATURE NEST</b> Every Day 10am-5pm</p></div>				<div><div>1</div><div>Story Time Penguin Feeding Penguin Feeding</div><div>10:30am 11:00am 3:30pm</div></div> <div></div>	
<div><div>ing ing</div><div>11:00am 3:30pm</div></div>		<div><div>6</div><div>Penguin Feeding Penguin Feeding</div><div>11:00am 3:30pm</div></div>	<div><div>7</div><div>Penguin Feeding Penguin Feeding</div><div>11:00am 3:30pm</div></div>	<div><div>8</div><div>Story Time Penguin Feeding Penguin Feeding</div><div>10:30am 11:00am 3:30pm</div></div> <div></div>	
<div><div>ing ing</div><div>11:00am 3:30pm</div></div>		<div><div>13</div><div>Penguin Feeding Penguin Feeding</div><div>11:00am 3:30pm</div></div>	<div><div>14</div><div>Penguin Feeding Penguin Feeding</div><div>11:00am 3:30pm</div></div>	<div><div>15</div><div>Story Time Penguin Feeding Penguin Feeding</div><div>10:30am 11:00am 3:30pm</div></div>	
<div><div>ing ing</div><div>11:00am 3:30pm</div></div>		<div><div>20</div><div>Penguin Feeding Penguin Feeding 3rd Thursday</div><div>11:00am 3:30pm 5:00pm</div></div>	<div><div>21</div><div>Penguin Feeding Penguin Feeding</div><div>11:00am 3:30pm</div></div>	<div><div>22</div><div>Story Time Penguin Feeding Penguin Feeding</div><div>10:30am 11:00am 3:30pm</div></div>	
<div><div>ing ing re</div><div>11:00am 3:30pm 8:00pm</div><div>Herbst Theatre</div></div>		<div><div>27</div><div>Penguin Feeding Penguin Feeding</div><div>11:00am 3:30pm</div></div>	<div><div>28</div><div>Penguin Feeding Penguin Feeding</div><div>11:00am 3:30pm</div></div>	<div><div>29</div><div>Story Time Penguin Feeding Penguin Feeding</div><div>10:30am 11:00am 3:30pm</div></div> <div></div>	



Sunday

Monday

Tuesday

Wedn



**1** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm

**2** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm



**3** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm

**7** Family Nature Crafts 10:30am  
Penguin Feeding 11:00am  
Rockin' Reptiles 1:00 pm  
Meet the Biologist 2:00 pm  
Penguin Feeding 3:30pm

**8** Family Nature Crafts 10:30am  
Penguin Feeding 11:00am  
Rockin' Reptiles 1:00 pm  
Meet the Biologist 2:00 pm  
Penguin Feeding 3:30pm

**9** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm

**10** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm



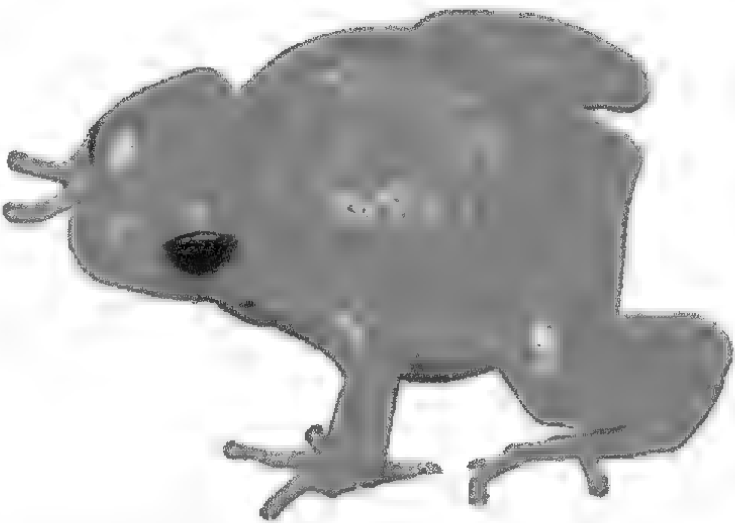
**15** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm

**16** Penguin Feeding 11:00am  
Academy Lecture 2:00pm  
Penguin Feeding 3:30pm  
Academy Lecture 7:30pm

**17** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm

**21** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm

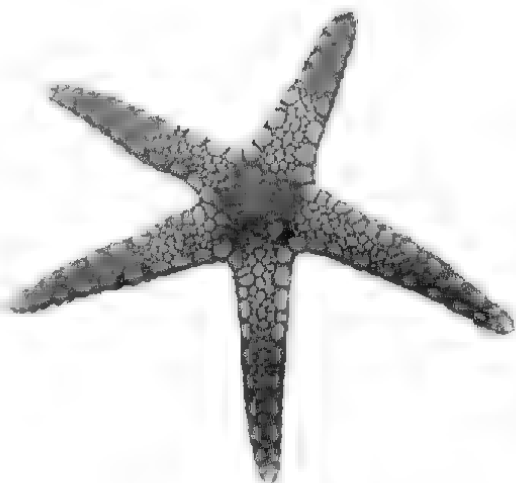
**22** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm



**23** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm

**24** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm

**28** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm





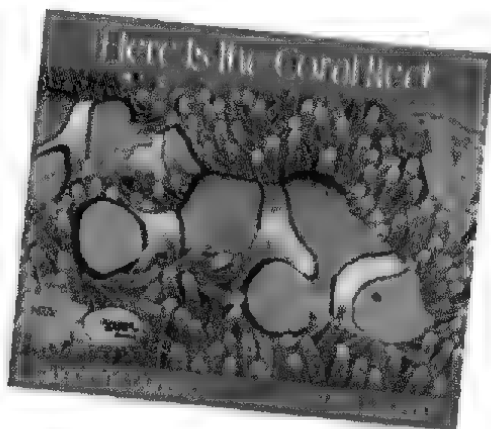
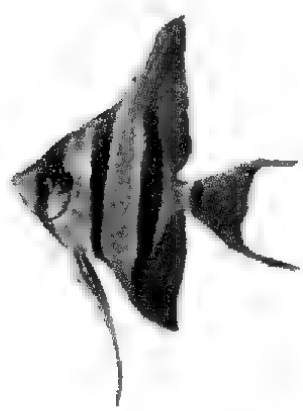

**29** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm  
Dean Lecture 7:30pm  
JCC SF

**30** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm



**31** Penguin Feeding 11:00am  
Penguin Feeding 3:30pm



Wednesday	Thursday	Friday	Saturday
ing 11:00am ing 3:30pm	<b>4</b> Home School Day 10:00am Penguin Feeding 11:00am Penguin Feeding 3:30pm	<b>5</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm Stargazing 7:30pm <i>SF Botanical Gardens</i>	<b>6</b> Story Time 10:30am Penguin Feeding 11:00am Rockin' Reptiles 1:00 pm Meet the Biologist 2:00 pm Penguin Feeding 3:30pm
ing 11:00am ing 3:30pm	<b>11</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm 	<b>12</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm	<b>13</b> Story Time 10:30am Penguin Feeding 11:00am Penguin Feeding 3:30pm
ng 11:00am ng 3:30pm	<b>18</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm 3rd Thursday 5:00pm 	<b>19</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm	<b>20</b> Story Time 10:30am Penguin Feeding 11:00am Penguin Feeding 3:30pm 
ng 11:00am ng 3:30pm	<b>25</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm 	<b>26</b> MUSEUM CLOSSES AT 3PM TODAY Penguin Feeding 11:00am Penguin Feeding 3:30pm Halloween Party 6:30pm <i>see page 23 for details</i> <b>BOO! from the Deep Blue</b>	<b>27</b> Story Time 10:30am Penguin Feeding 11:00am Penguin Feeding 3:30pm 

ng 11:00am  
ng 3:30pm



# OCTOBER

Please see Programs & Highlights on pages 6-7, and Lectures on pages 8-9 for a full description. For more information, check our website: [www.calacademy.org](http://www.calacademy.org).



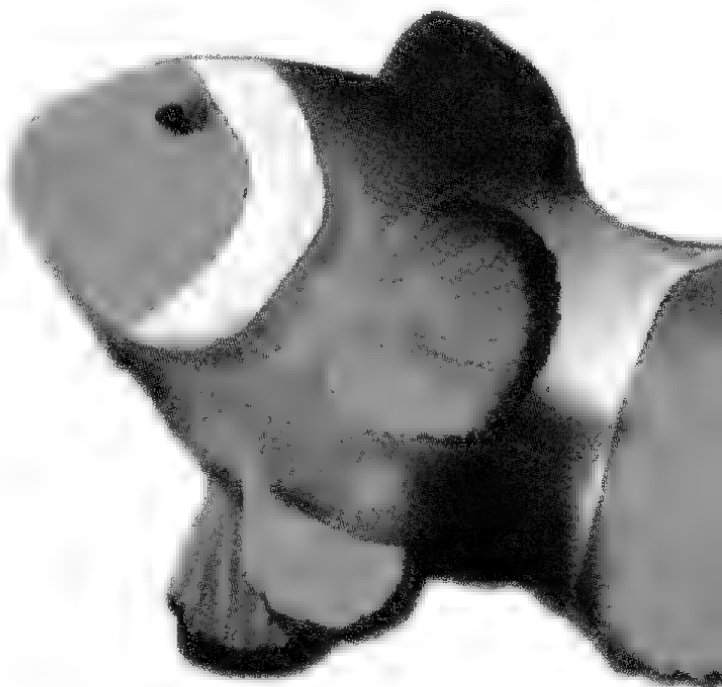
Sunday

Monday


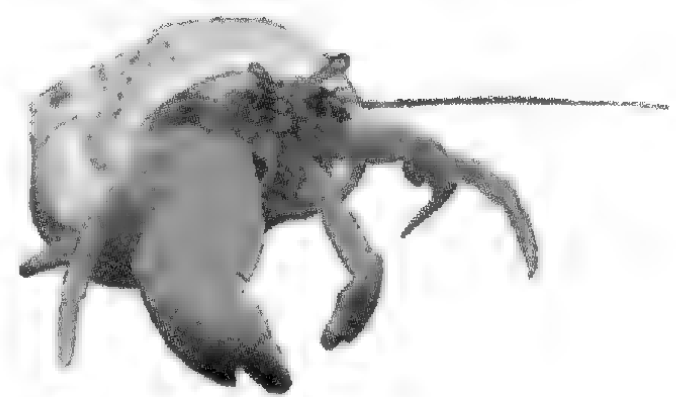
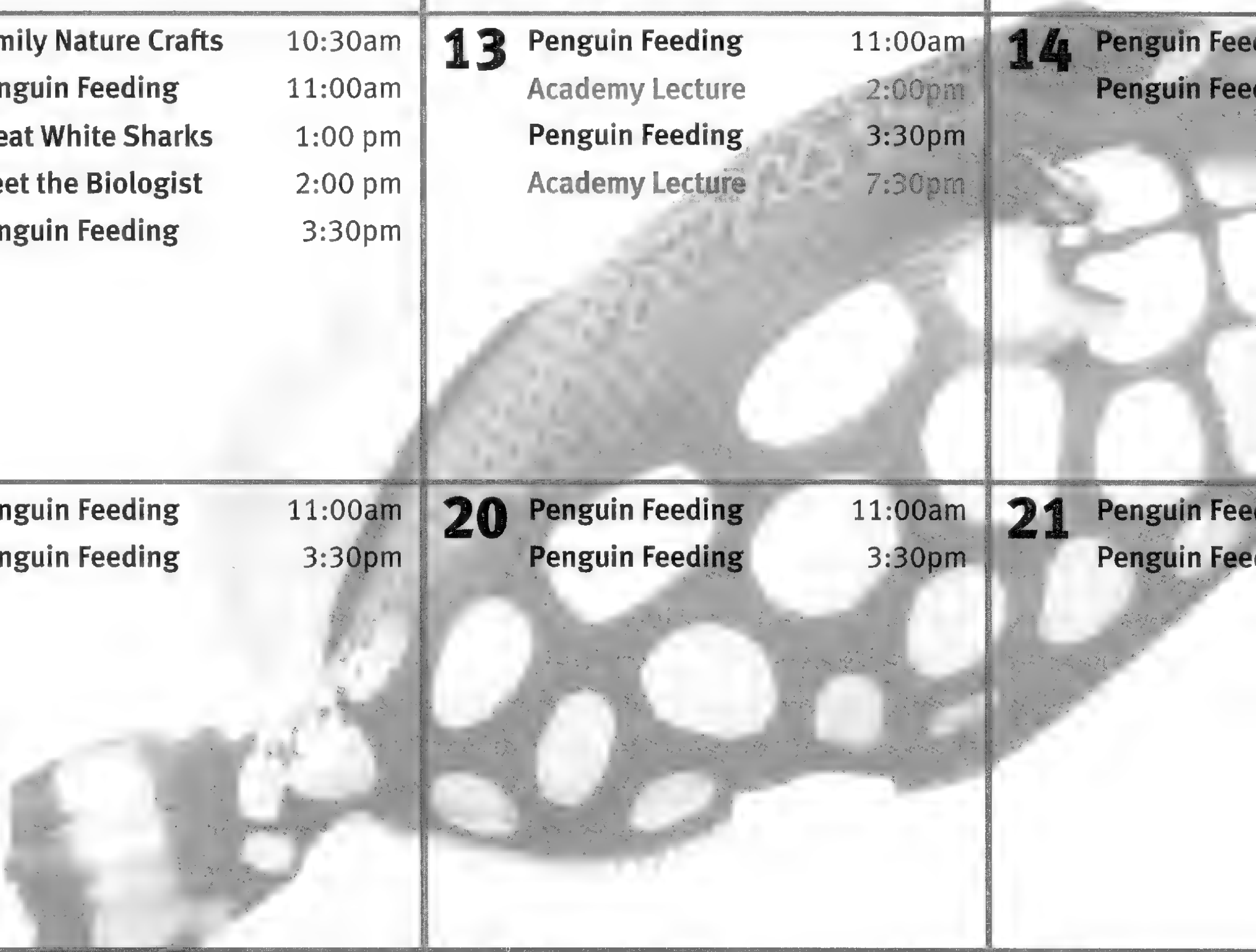

Tuesday

Wednesday

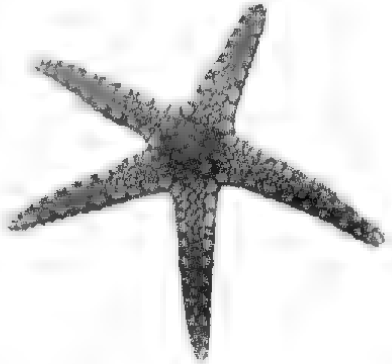

NOVEMBER



Please see Programs & Highlights on pages 6-7, and Lectures on pages 8-9 for a full description. For more information, check our website: [www.calacademy.org](http://www.calacademy.org).

<div>4</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div></div>	<div>5</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div></div>	<div>6</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div></div>	<div>7</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div></div>
<div>11</div> <div>Family Nature Crafts Penguin Feeding Rockin' Reptiles Meet the Biologist Penguin Feeding</div> <div>10:30am 11:00am 1:00 pm 2:00 pm 3:30pm</div>	<div>12</div> <div>Family Nature Crafts Penguin Feeding Great White Sharks Meet the Biologist Penguin Feeding</div> <div>10:30am 11:00am 1:00 pm 2:00 pm 3:30pm</div>	<div>13</div> <div>Penguin Feeding Academy Lecture Penguin Feeding Academy Lecture</div> <div>11:00am 2:00pm 3:30pm 7:30pm</div>	<div>14</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div></div>
<div>18</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div><div>In-person registration for <b>RUN WILD!</b> available at the Academy</div></div>	<div>19</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div></div>	<div>20</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div></div>	<div>21</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div></div>
<div>25</div> <div>Family Nature Crafts Penguin Feeding Rockin' Reptiles Meet the Biologist Penguin Feeding</div> <div>10:30am 11:00am 1:00 pm 2:00 pm 3:30pm</div> <div><b>RUN WILD!</b></div>	<div>26</div> <div>Penguin Feeding Penguin Feeding Dean Lecture</div> <div>11:00am 3:30pm 7:30pm JCC SF</div>	<div>27</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div></div>	<div>28</div> <div>Penguin Feeding Penguin Feeding</div> <div>11:00am 3:30pm</div> <div></div>



Wednesday	Thursday	Friday	Saturday
	<b>1</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm	<b>2</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm 	<b>3</b> Story Time 10:30am Penguin Feeding 11:00am Penguin Feeding 3:30pm
ding 11:00am ding 3:30pm	<b>8</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm  <b>SUPPORT THE ACADEMY BY SHOPPING ONLINE</b> <a href="http://calacademy.freepledge.com/">http://calacademy.freepledge.com/</a>	<b>9</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm	<b>10</b> Story Time 10:30am Penguin Feeding 11:00am Rockin' Reptiles 1:00 pm Meet the Biologist 2:00 pm Penguin Feeding 3:30pm 
ding 11:00am ding 3:30pm	<b>15</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm 3rd Thursday 5:00pm 	<b>16</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm  <i>Last day to register for</i> <b><i>RUN WILD!</i></b> by mail	<b>17</b> Story Time 10:30am Penguin Feeding 11:00am Penguin Feeding 3:30pm
ding 11:00am ding 3:30pm	<b>22</b> Penguin Feeding 11:00am Penguin Feeding 3:30pm	<b>23</b> Family Nature Crafts 10:30am Penguin Feeding 11:00am Let's Talk Turkey 1:00 pm Meet the Biologist 2:00 pm Penguin Feeding 3:30pm	<b>24</b> Story Time 10:30am Penguin Feeding 11:00am Rockin' Reptiles 1:00 pm Meet the Biologist 2:00 pm Penguin Feeding 3:30pm 
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**September 11** ●

**New Moon** at 5:44 am PDT. No crescent visible tonight, but look tomorrow night (the 12th) just after sunset. This sighting will mark the start of both *Ramadan*, the month of fasting in the Islamic calendar, and *Rosh Hashanah*, the Jewish New year.

A *partial solar eclipse* occurs as the Moon moves between the Earth and the Sun, but its shadow barely grazes our planet. From locations in the lower two-thirds of South America and the Antarctic Peninsula, its dark silhouette blocks only a portion of the Sun's disk.

**September 23**

**Fall Equinox** at 2:54 a.m. PDT. The Sun rises due east and sets due west, and day and night are of equal length as the days continue growing shorter and the nights longer. In the southern Hemisphere, it's the Spring Equinox.

**September 26**

Today's **Full Moon** (12:46 pm PDT), being the nearest to the Fall Equinox, is also known as the "Harvest Moon," so-called because its bright light extends the time that farmers can continue working in the fields after sunset. Also called the "Cool Moon" by the Cheyenne, the "Salmon Spawning Moon" by the Haida, and the "Small Moon" by the Tlingit. Located against the stars of Pisces.

**October 10**

**New Moon** at 10:01 pm, but listed in some calendars as being on the 11th because converting to Central, Eastern, or Greenwich Time crosses midnight, thus changing the date. Sighting of the first thin crescent at sunset on the 11th marks the start of the month *Shawaal* in the Islamic calendar.

**October 21** ★

Peak of the **Orionid meteor shower**, caused by dust from Halley's Comet. Fairly favorable this year, but not perfect, as it occurs a few days before full Moon. Though named after the constellation Orion, that doesn't mean to look only toward those stars. After midnight, afford yourself as wide-angle a view of the sky as possible, and expect perhaps 20 meteors per hour.

**October 25** ○

**Full Moon** at 9:52 pm PDT, located against the stars of Aries. Also known as the "Time of Poverty" to the Mohawk, "Falling Leaves Time" to the Nez Perce, and the "Turkeys Moon" to the Natchez. The full Moon following the "Harvest Moon" (see Sept 26th) is traditionally known as the "Hunter's Moon."

**October 28**

According to the old rule, this would have been when the U.S. returned from Daylight Saving Time to Standard Time...but no longer – **DON'T ADJUST YOUR CLOCKS FOR ANOTHER WEEK** or you'll be an hour late for everything! For the reason why, see the next entry.

**November 4**

This is the new date on which **Daylight Time ends** – at 2:00 am (or, better yet, at bedtime previous), set clocks back one hour and "fall back" to Standard Time. The Energy Policy Act of 2005 lengthened Daylight Saving Time by four weeks, so instead of starting on the first Sunday in April and ending on the last Sunday in October, it now runs from the *second Sunday in March to the first Sunday in November*.

**November 9** ●

**New Moon** at 3:03 pm. Tomorrow night (the 10th), look for the first visible, thin crescent moon low in the west just after sunset, marking the start of the month *Dhul-Qi'dah* in the Islamic calendar.

**November 18** ★

Peak of the **Leonid meteor shower**. Although this shower has returned to its normal rate of 15 meteors per hour in the years since the return of its parent comet, some astronomers think an outburst is possible this year. The waxing gibbous Moon should set around 1:00 am, leaving the rest of the midnight-to-dawn "viewing window" unspoiled by moonlight.

**November 24** ○

**Full Moon** at 6:30 am PST, located against the stars of Taurus. Also known to the Natchez as the "Bison Moon," to the Haida as the "Stomach Moon," and to the Choctaw as the "Sassafras Moon."

**SHINE ON, SHINE ON,  
HARVEST MOON**

Have you ever noticed how big the full Moon looks when it rises...and not just the Harvest Moon, but ANY full Moon? Aside from looking larger, it's also a rich, golden color, which seems to be noticed more during the Fall season. The color is real, resulting from the same atmospheric phenomenon that causes sunrises and sunsets to redden: when the Moon rises, its light is passing tangentially through the atmosphere to reach our eyes and as a result has to pass through more air, which scatters out the light at the blue end of its spectrum. This leaves the more penetrating red and orange wavelengths to reach us. When the Moon is higher in the sky, the reddening decreases and our satellite assumes its normal white color.



On the other hand, the Moon's exaggerated size, known as the "Moon Illusion," is just that – an illusion. Photographic time-lapses of the rising full Moon show it to be the same size on the horizon as when it's higher in the sky, so why does it LOOK larger to the naked eye? Some attribute this psychological effect to the fact that on or near the horizon, the full Moon can be seen with buildings or trees that provide references for comparison which are absent when the Moon has risen much higher in the sky and is seen all by itself.



# The Planets

## Mercury

An evening object in September, located low in the west at sunset, Mercury reaches greatest eastern elongation on September 29th, but because the path of the planets is at such a shallow angle with respect to the horizon at that time, the fastest planet doesn't put on a very favorable appearance for observers at the northern mid-latitudes. It disappears into the Sun's glow for most of October, reappearing in the morning sky late in the month. In late October and early November, don't confuse it in the morning sky with the star Spica, to its right. Mercury reaches greatest western elongation on November 8th, rising about 90 minutes before dawn. By late November, it retreats back into the Sun's glow. Use the crescent Moon to find Mercury on the evenings of September 12th & 13th (difficult to see), the evening of October 12th (also difficult), and the mornings of November 7th & 8th (easy!).

## Venus

Venus is a dazzling morning object, rising about 90 minutes before dawn in early September. As the season progresses, it rises earlier and appears higher and higher in the sky by dawn. Moving gradually from the stars of Cancer through Leo and into Virgo, the brightest planet remains high in the predawn sky well into next Spring. It forms a spectacular grouping with Saturn, the waning crescent Moon, and the star Regulus high in the east before sunrise on the morning of October 7th. The Moon swings nearby for photogenic pairings on the mornings of September 8th & 9th (with Saturn nearby), October 7th (Saturn closer still), and November 5th. Since Venus is so bright, how long past sunrise can you continue to see it in the sky?

## Mars

The Red Planet rises at about midnight in the beginning of September against the stars of Taurus the Bull, rivaling the appearance of the star Aldebaran (the eye of Taurus) in brightness and color. Rising a few minutes earlier from night to night, it continues eastward against the stars and enters Gemini in October, then retrogrades in November, seemingly reversing its motion – only an apparent effect as the Earth passes slower-moving Mars in their race around the Sun. The Moon and Mars pair up on the mornings of Sept 4th and October 2nd, the evening of October 29th/ morning of October 30th, and the evening of November 26th.

## Jupiter

Look toward the south-southwest after sunset for the largest of the planets, which, while not quite as bright as Venus, is bright enough to be seen before any of the stars appear. It's located near the bright star Antares, the heart of Scorpius, although actually within the boundaries of the more obscure constellation Ophiuchus. As the season progresses, it slowly drops toward the setting Sun, and by the end of November, it will disappear into the twilight. Jupiter encounters the Moon on the evenings of September 17th (with Antares between them), October 15th, and November 12th.

## Saturn

This season, Saturn emerges from the glow of the rising Sun, appearing higher and higher in the east at dawn against the stars of Leo and slowly separating from the star Regulus after a close approach on September 1st. Rising toward brilliant Venus, it has a close encounter with the brightest planet in mid-October, following a spectacular predawn clustering of the two planets, Regulus, and the Moon on October 6th & 7th. The Moon's closest passes near Saturn are on the mornings of September 9th (with Venus nearby), October 7th (that previously-mentioned grouping), and November 3rd (with Regulus just west of the Moon).

	SUNRISE	LOCAL NOON	SUNSET
SEPTEMBER 1	6:40 AM PDT	1:09 PM PDT	7:39 PM PDT
OCTOBER 1	7:05 AM PDT	12:59 PM PDT	6:53 PM PDT
NOVEMBER 1	7:35 AM PDT	12:53 PM PDT	6:11 PM PDT

(Times are for San Francisco, CA, and will vary slightly for other locations.)

# HELP WANTED: ON OPENING DAY AND BEYOND

The public floor of the new Academy will be abuzz with activity, and volunteers will play a crucial role in facilitating the visitor experience. The Academy is looking for enthusiastic and passionate people to become Academy Guides, whose main responsibility will be to inspire and educate visitors through specimen carts, comet and volcano demonstrations, focus talks, and live animal programs.

Training begins in February 2008. These fun and hands-on sessions will cover a variety of natural science topics, such as the rainforest, African wildlife, California and climate change, coral reefs, and astronomy.

Your participation is greatly needed! Encourage your friends and relatives to join you in launching the next chapter of the Academy's history.



Contact Rosalind Henning at  
(415) 321-8111 or  
rhenning@calacademy.org  
for Academy Guide and other  
volunteer opportunities.



## ACADEMY TRAVEL PROGRAM 2008

*The mission of the Travel Program is to offer Academy-led tours that place members in the context of specifically chosen natural environments. Teaching, understanding, and conservation are our goals.*

# Galápagos Family Adventure

Aboard the *Santa Cruz*

June 22 – July 1, 2008

Leader: Jack Dumbacher



*'Galápagos Family Adventure' is only one of the many Academy-led tours. Listed below are more travel opportunities.*

### **Belize Barrier Reef: Jewel of the Caribbean**

Aboard *Le Levant*

January 11 – 18, 2008

Leader: Bob Van Syoc

### **Mysteries of the Maya**

January 19 – 26, 2008

Guest Leader: Richard Hansen

### **Treasures of the Pharaohs: Egypt and the Nile**

Aboard the *Sun Boat IV*

Feb 13 – 25, 2008

Leader: Jean DeMouthe

### **Jewels of the South Pacific:**

**Tahiti, the Marquesas, and the Tuamotus**

Aboard the *Spirit of Oceanus*

Feb 17 – 28, 2008

Leaders: John and Pam McCosker

### **Springtime in the Mediterranean:**

**Malta, Sicily, and Sardinia**

April 12 – 24, 2008

Leaders: Frank and Mary Beth Almeda

### **Trinidad and Tobago**

April 20 – 29, 2008

Leaders: Peter Roopnarine and Carol Tang

### **Alaska's High Arctic**

May 31 – June 12, 2008

Leaders: Dave and Bev Kavanaugh

### **Lake Baikal and the Total Solar Eclipse**

Aboard the *Vampirov*

July 18 – August 2, 2008

Leader: Patrick Kociolek

### **Patagonia: Crown Jewel of South America**

October 7 – 20, 2008

Leaders: Terry and Bonnie Gosliner

### **Polar Bears and Wildlife of Churchill, Canada**

October 30 – November 5, 2008

November 4 – 10, 2008

Leader: Douglas Long

For brochures or additional information, please contact the Academy Travel Office.  
Phone 415.901.8129 or 800.853.9372 E-mail: [calacademy@hcaptravel.com](mailto:calacademy@hcaptravel.com)





# Bombardier Beetles

These  
well-armed beetles  
aren't just beauties, they're bombshells.

Photo by David R. Maddison

Seven years ago, Wendy Moore pulled out a drawer of beetles in the Academy's entomology collection and fell in love. At the time she was a graduate student at the University of Arizona, and she had traveled to the Academy—home of the most extensive and well-curated beetle collection in any museum, she says—to nail down the focus of her Ph.D. dissertation. It was during this visit that she first laid eyes on a paussine, or flanged bombardier beetle.

"What initially caught my eye was the mind-boggling diversity of shapes and structures in this group," Moore says. "I had never seen beetles like that before. I'll never forget seeing the first specimen under the microscope. I couldn't tell exactly what I was looking at—not even the standard beetle body parts were readily discernable. But what really

astounded me was that every specimen I examined was just as odd, and yet totally different from the previous specimen, and that happened time and time again!"

Later, back in her hotel room, she spent the night engrossed in a 95-page paper on paussines, written in 1950 by entomologist Philip Darlington. The list of bizarre traits grew longer and longer . . . and Moore was hooked. Over the next several years, her pursuit of live paussine specimens would take her to Africa, Central and South America, and Australia.

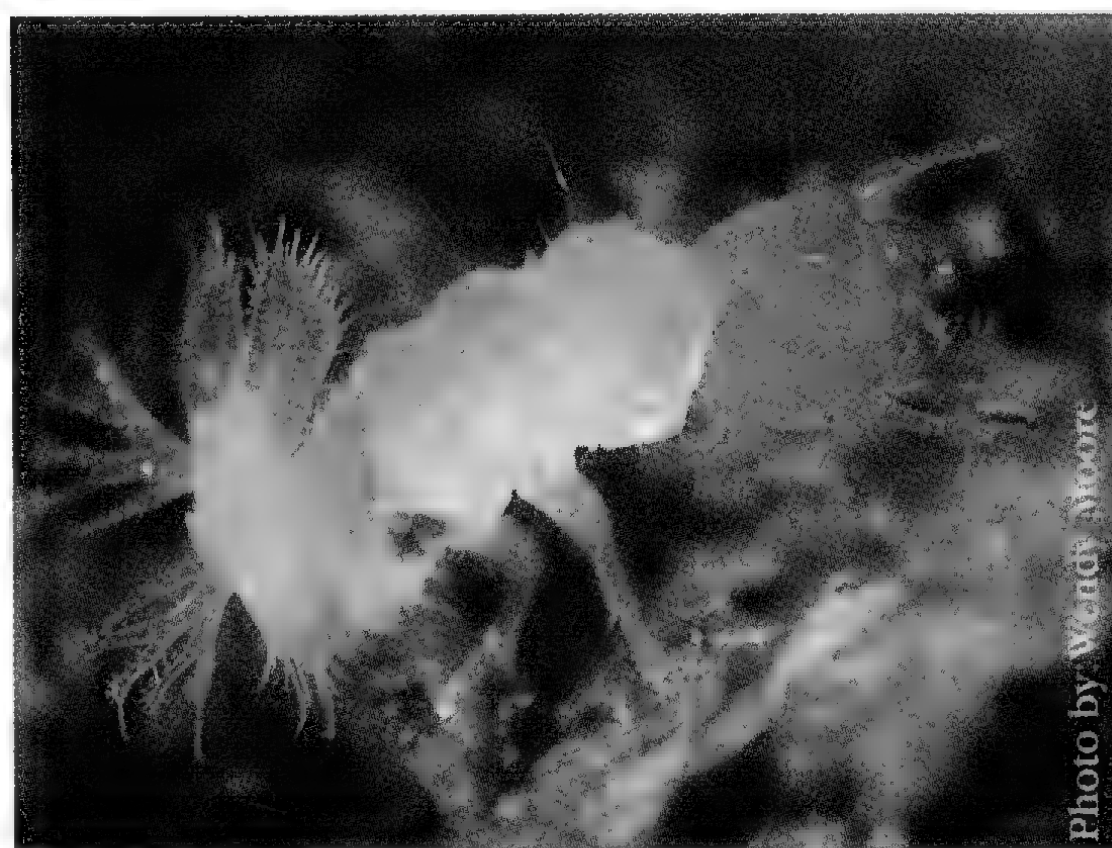
Today, Moore is one of the world's experts on paussines, and she has returned to the Academy as a post-doctoral fellow to continue her research. Though she has learned and published much about the beetles since her

first sighting of them, there are still many questions to explore. And to the paussine novice, Moore loves pointing out the unusual features that attracted her to them in the first place. Her enthusiasm for paussines is contagious, and listening to her, one can't help being drawn into their bizarre world.

## Bombs Away

"Bombardier" is an antiquated term for a person who fires cannons, and bombardier beetles are so named because of their explosive abilities. When threatened, adult beetles fire a hot, caustic liquid from their rear ends. The liquid can reach temperatures of up to 100°C and creates an audible *pop!* when discharged. Charles Darwin, an ardent collector of insects, once put a bombardier beetle in his mouth and was quickly "bombed." He spit it out and the beetle escaped.





Left: Dr. Wendy Moore with her paussine beetles. Center: Paussine larvae have a distinctive “terminal disk.” Right: Ants surround a paussine and feed on its chemicals.

The mechanism behind bombing is a marvel of evolution. Inside the beetle, a special gland produces a mixture of hydroquinones and hydrogen peroxide, which travels down a long duct and accumulates inside a reservoir chamber. When the beetle wishes to deliver a bomb, the chemicals are forced through a one-way valve into a reaction chamber, where they come in contact with enzymes that induce an explosive, exothermic reaction. The end products are benzoquinone (the caustic agent), oxygen (which provides the propelling force), water, and heat. They emerge from an exit pore at high velocity. Each beetle is equipped with two of these systems, side by side.

### The Coanda Effect

There are two groups of bombardier beetles, the Paussinae and the Brachininae. While brachinines can swivel the tip of their abdomen to spray in any direction, paussines are not as flexible, but can still aim their spray forward thanks to a phenomenon known as the Coanda effect.

Anyone who has ever poured milk from a jug and watched it dribble onto the tablecloth has witnessed the Coanda effect—it is the tendency of moving fluids to stream along a curved surface rather than follow a straight

path. Paussine beetles harness the Coanda effect with a slight protrusion, or “flange,” on each side of their body. When attacked from the front, they align their exit pore with the flange; the stream of chemicals that bursts out follows the curve of the flange toward the front of the body. When they want to spray in a direction other than forward, they simply disengage the flange by moving the exit pore out of alignment.

The effect is named after Henri Coanda, a Romanian engineer who almost died because he put flanges on an aircraft that he thought would direct the jet exhaust outward. Instead, the exhaust streamed along the flanges back toward the aircraft. Had he been acquainted with the paussine beetle, he might have avoided the accident. Nevertheless, entomologists acknowledge the beetle’s inventive use of his fluid dynamic principle by naming its little protrusion “the Flange of Coanda.”

### A Rear Door and More

What first attracted Moore to paussine beetles was their mind-boggling diversity of physical attributes. The larvae, for example, have a two-part, fan-shaped disk on their rear ends, fringed with bristles and antler-like projections. They use this disk as a door, plugging the entrance of their burrows

and waiting for unsuspecting insects to approach. When an insect stimulates sensors on the disk, its two halves slam shut and capture the prey.

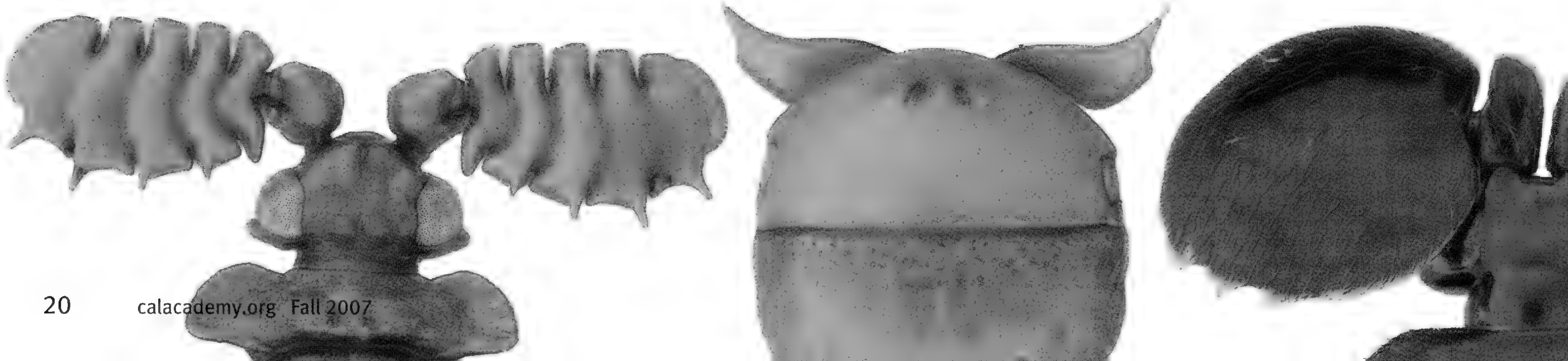
“In effect,” Moore says, “these larvae wield a Venus fly trap on their rear ends.”

The adults also have their share of odd appendages. Most noticeable are the antennae, which can take on a variety of shapes: flat, slender, ribbed, ovoid, pointed, spoon-shaped, and more. Examination under a microscope reveals other curious traits, such as strangely modified mouthparts, pits in the head, deep clefts in the thorax, tiny chemical-dispersing hairs all over the body, and legs that range from wide and flat to long and thin.

What is the driving force behind this wild anatomical diversity? They are adaptations for living with some of the most ferocious predators in the world—ants!

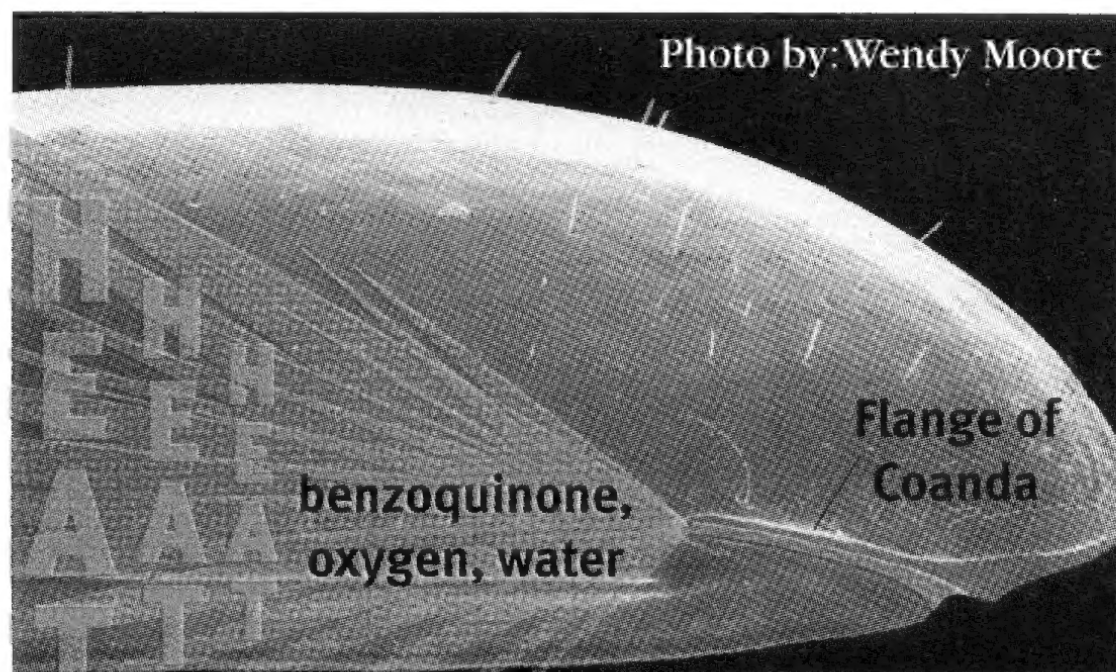
### Ant Lovers

Ants will usually dismember any foreigner that attempts to enter their nest. Some insects, however, have cracked the code of getting inside. These interlopers are called myrmecophiles, or “ant lovers.”

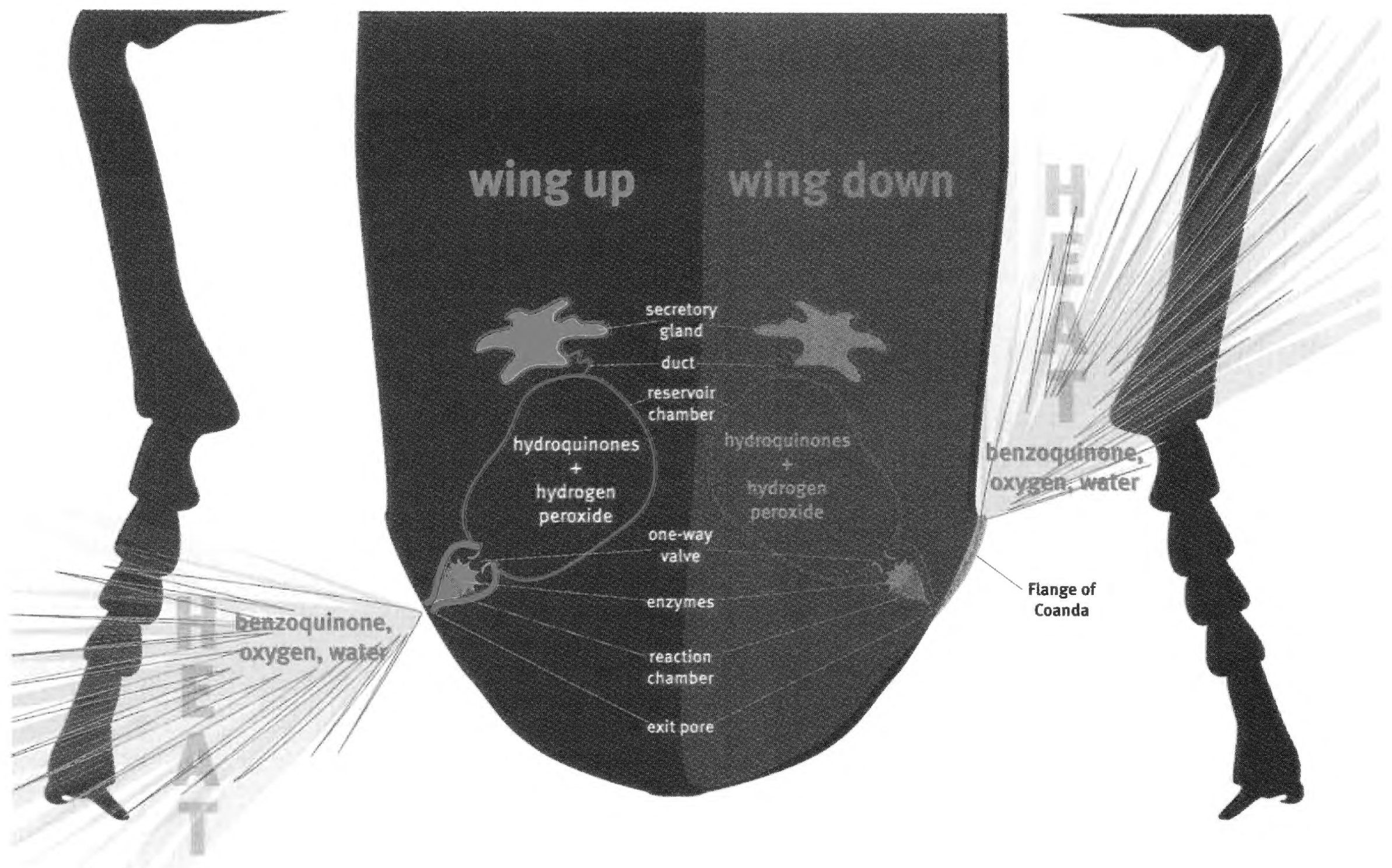




Right: Glands of the bombardier beetle. Chemicals produced by the gland are stored in a reservoir chamber. When forced into the reaction chamber, they undergo an explosive chemical reaction and blast out the exit pore at up to 100°C.



The Flange of Coanda directs defensive chemicals toward the front of the body.



Many species of paussine beetles are myrmecophiles, and they employ two strategies to gain entry into ant nests. The “defiant” type tucks in its legs and hunkers down like a miniature tank, withstanding the barrage of ant attacks with its thick exoskeleton. The “symphilic” type is more cunning: ants will actually surround it and drag it inside the nest. The paussine, for its part, will flail its legs in apparent show of resistance. Moore suspects, however, that this behavior allows the beetle to pick up the scent of the ants, masking its own odor.

“The trick is in the chemistry,” Moore says. “Ants perceive the world chemically through touch, so if the beetle smells like an ant, the ants are none the wiser. What’s more, these paussines secrete chemicals from specialized glands in their antennae and in the deep clefts and pits—these chemicals seem to act as food or drug to the ants, inducing the ants to drag the beetles into their home.”

Once inside the nest, the paussines

feed on the very ants that dragged them inside, as well as the most precious resource in the ants’ nest—their eggs and larvae. Furthermore, paussines lay their own eggs in the nest. Moore explains, “By cracking the chemical code of the ant colony, paussines simultaneously solve two of the great challenges in the living world—finding a reliable source of food and providing safe shelter for their young.”

The ants appear to get nothing out of the relationship, besides the satisfaction of the paussine’s mysterious chemicals. Because of their Trojan horse tactics and feats of chemical deception, Moore considers paussines to be “the ultimate myrmecophiles.”

Moore is working on two projects at the Academy. First, she is investigating how paussines from Madagascar fit into the larger scheme of paussine evolution and biogeography. Having sorted through 70 insect traps that the Academy maintains in Madagascar, she estimates that they contain about 25 new species and

several new genera. Second, Moore is researching the systematics of the Bay Area’s own paussine species, *Metrius contractus*. It lives along the West Coast from Monterey up to British Columbia, as well as in the high Sierras. It is a primitive member of the group, lacking both flanges and myrmecophilous behavior.

Although her work on paussines is already broad, Moore has a host of other questions that she eventually wants to tackle. How do they manufacture hydroquinones and hydrogen peroxide? How closely related are brachinines and paussines? What exactly is the mystery chemical that ants love? Do ants feed the paussine larvae that hatch in their nests? High on Moore’s wish list is to rear a live ant colony with paussines and observe their interaction first-hand. She would also like to collect paussines from India and Southeast Asia, the two major gaps in her data set.

“This could take several lifetimes of work,” she says. “Luckily, I think working on bombardier beetles is a blast.”

A modest sample of the astonishing diversity among symphilic-type paussines.

Antenna photos by: Wendy Moore

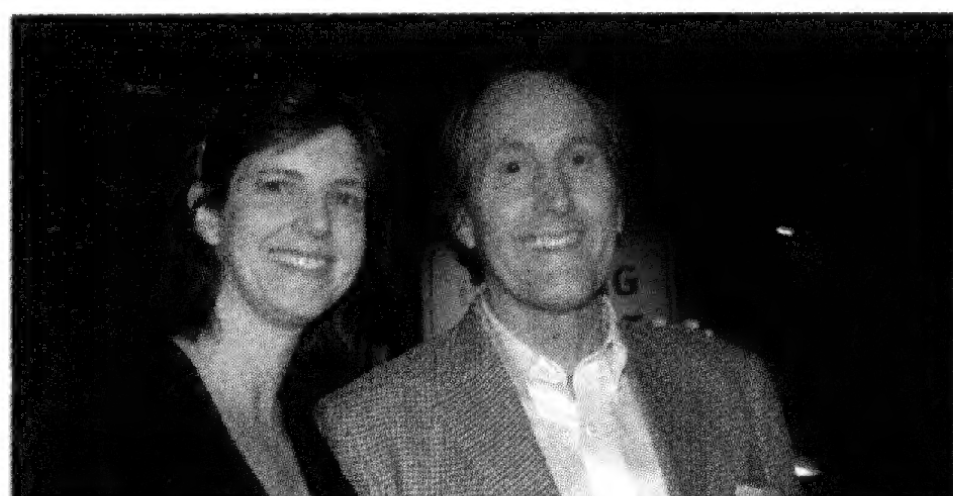


## Friends of the Academy

Friends of the Academy were honored at a special reception in May featuring Dr. Chris Andrews, who shared plans for the new Steinhart Aquarium and preparations for the return to Golden Gate Park.



Corrina Bonomo and Lauren Hall



Pasha and William Thornton



Trustee Janet McKinley with Jake and Cindy Walker

**For more information about Friends of the Academy, contact Jeanna Yoo at 415.321.8413 or [jyoo@calacademy.org](mailto:jyoo@calacademy.org).**

## Behind-the-Scenes Fish Tours for Donor Circle Members

Curator Circle, Director's Circle, and President Circle members are invited to take a fascinating docent-led tour. Learn about the coral rearing pods, watch biologists prepare food for the animals, and see the water filtering system for the aquarium. **10:30 am - Noon Friday, September 28 & Friday, October 12** Free with your Donor Circle membership. Space is limited and reservations are required. Participants must be 5 years or older. To reserve a space or to upgrade your membership to attend, call Nicole Leventhal at 415.321.8412.



**Members' eNews** To sign up for the monthly Members' eNews, send your name, membership number, and email address to [membership@calacademy.org](mailto:membership@calacademy.org). We do not trade or share this information. Membership questions? Contact us: 415.321.8000, toll free 800.794.7576 Monday – Friday, 8:00 am to 5:00 pm or [membership@calacademy.org](mailto:membership@calacademy.org).

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# BOO! from the Deep Blue

16<sup>th</sup> Annual Halloween Costume Party  
presented by the Academy Guild

Trick or treat at Steinhart Aquarium!  
Don't miss this annual event, which  
has become a tradition for many Bay Area  
families. The Halloween Party features  
scientists showcasing their creepiest  
creatures, delicious shark bites, ocean-  
inspired activities, and live entertainment.

Friday, October 26, 6:30 – 8:30 pm

Benefactor tickets: \$2,500 (Sharks),  
\$1,000 (Rays), and \$500 (Eels)  
Benefactor tickets include admission to the  
pre-party at 5:00 pm, valet parking, and more.  
General tickets: \$350 per family

Tickets go on sale Wednesday, September 5.

For more information,  
call 415.321.8405,  
email [guild@calacademy.org](mailto:guild@calacademy.org), or visit us  
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This event sells out,  
so please purchase  
your tickets early.

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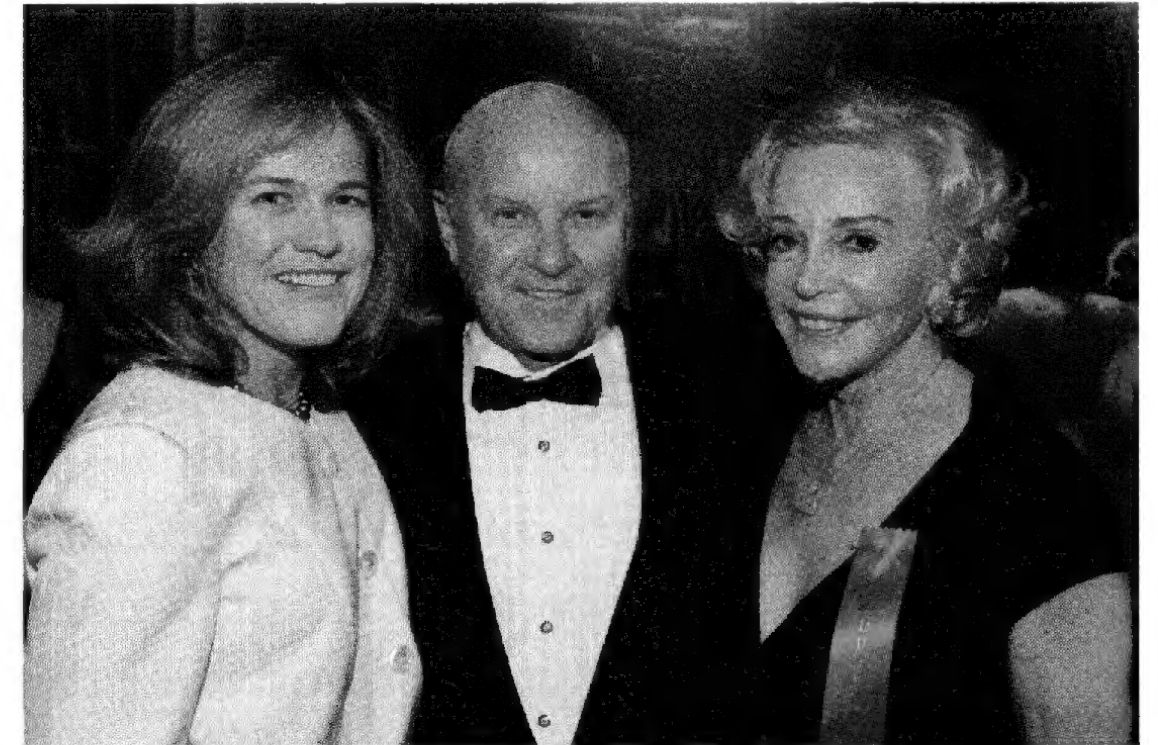
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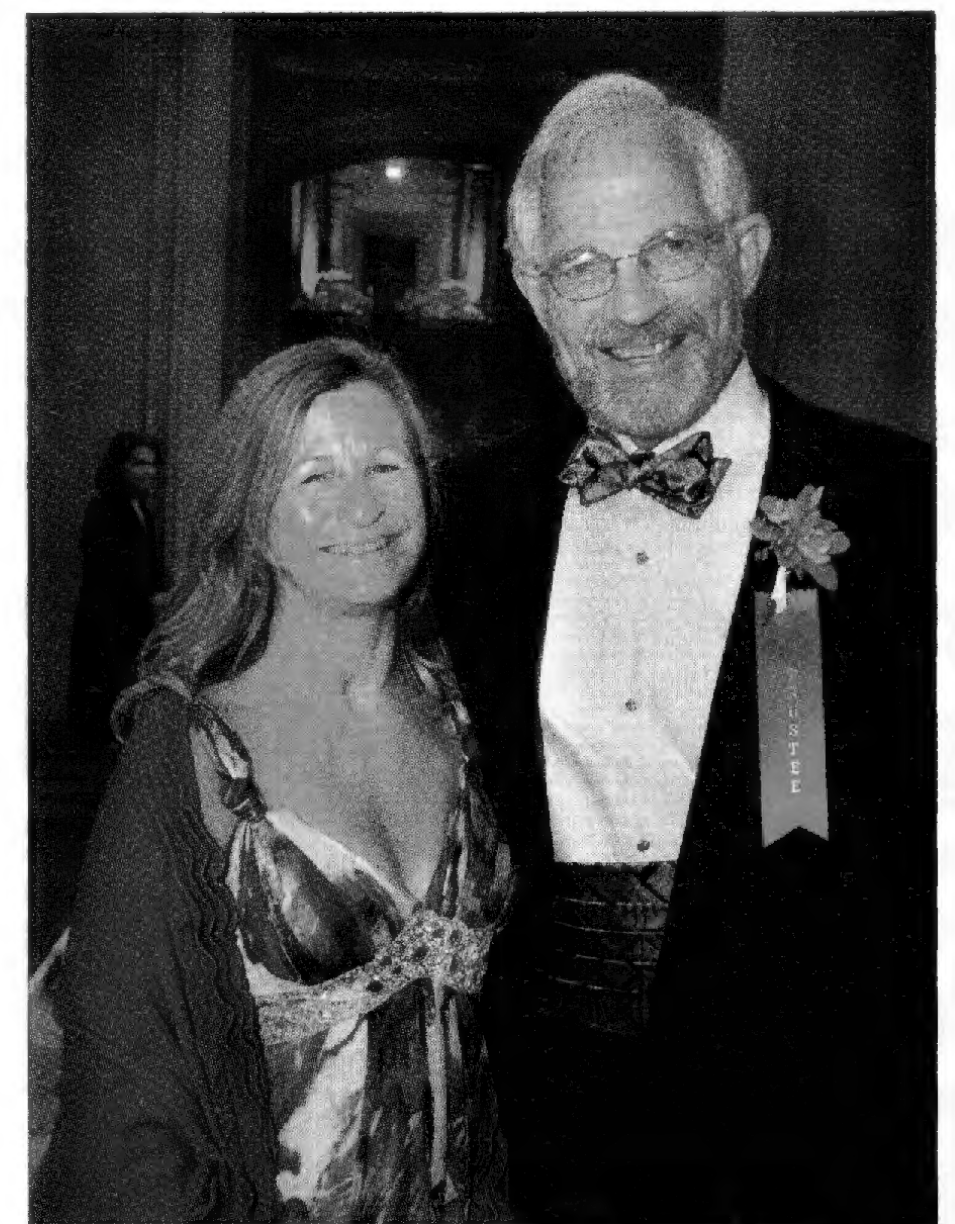
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On May 10, 2007, the Academy held  
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Approximately 600 guests enjoyed a  
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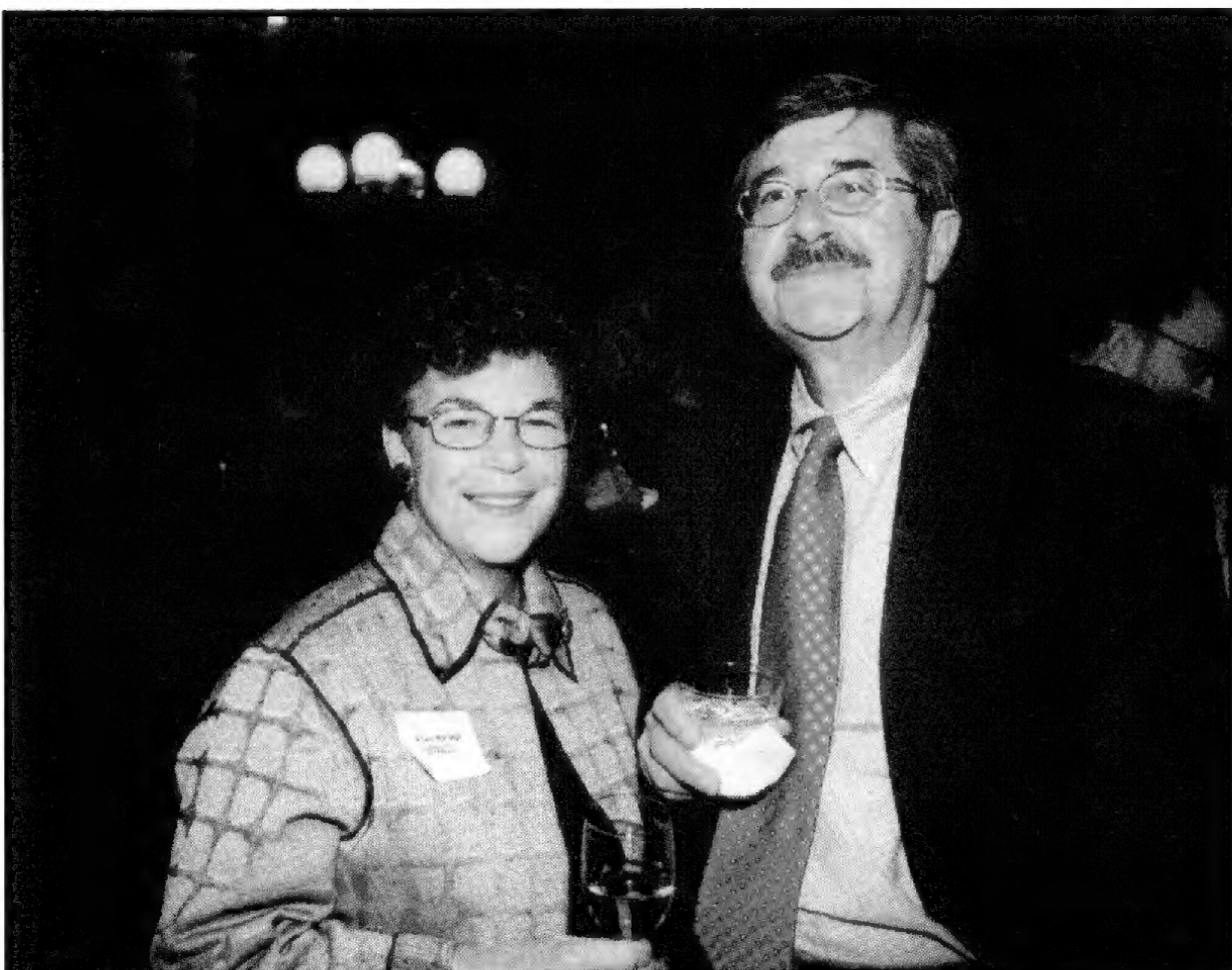


Photo by: Caroline Koppp

Clare Springs with James Kropf at a soiree in honor  
of Academy Friends and Eastwood Associates.

**ADVICE FROM AN EXPERT:** Clare H. Springs is a former trustee of  
the Academy, an estate planning attorney with Titchell, Maltzman, Mark  
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- Click on "Support the Academy."
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*Top: The new Academy as seen from the de Young tower on July 31, when plant installation on the living roof was nearly complete. Right: The original barrel-vaulted entrance to Steinhart Aquarium has been recreated in front of the Swamp tank.*

The first Steinhart Aquarium animals have yet to move into their new tanks in Golden Gate Park, but the new Academy building is already home to thousands of living organisms. More than 1.7 million native California plants have now been installed on the Academy's living roof, and over the past several months a wave of color has swept across the rolling hills. Tidy tips and goldfield plants have produced a profusion of yellow blossoms, while California poppies and self heal have added splashes of orange and purple.

Inside the building, many of the architectural details and aquarium habitats are also taking shape. The original barrel-vaulted entrance to Steinhart Aquarium has been recreated and the Swamp tank is awaiting the return of its bronze seahorse railing. Rockwork specialists are currently creating sculpted rock walls and platforms inside the Coral Reef, California Coast, Alligator Gar, and Penguin tanks, providing realistic habitats for the tanks' future occupants. Meanwhile, the planetarium is being prepared to receive its massive projection screen, which will measure 75 feet in diameter.

Although the building is still a year away from its public opening date, it will be ready to start receiving its new inhabitants within the next few months.



*Left: California poppies, self heal, tidy tips and goldfield erupted into bloom in August. Center: The glass canopy over the central piazza is now complete. Right: Rockwork experts from Dixon Studios have created a realistic landscape inside the Coral Reef tank.*

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